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THE IRON TRADE REVIEW

A Weekly Journal Devoted to the Machinery, Metal-Working and Foundry Trades, and Iron and Steel Manufacture.

VOLUME XXXVII. CLEVELAND, OHIO, AUGUST 18. 1904 NUMBER 33

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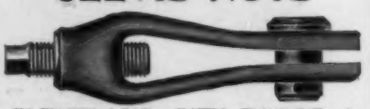

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THE IRON TRADE REVIEW

VOLUME XXXVII. CLEVELAND, OHIO, AUGUST 18, 1904 NUMBER 33

THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

Uncertainty as to the price of semi-finished steel and reports of concessions on finished products by pools have dominated the iron trade in the past week. The effort in some quarters to have the Pittsburg Steel Co. conversion contract regarded as of little significance does not tally with the amount of attention given the transaction by the leading steel manufacturers in recent conferences. Some authorities in the trade have expressed the opinion that an open market in steel with reduced prices in certain finished products, may be seen before the close of the week. While it is well understood that the agreement on billets has not been strictly observed, the official price has been treated as the mark to which every seller has aimed in taking business. Usually cuts of $1, or in special cases $2, have been sufficient. In the past week $20 has been openly done in the Pittsburg district. Sheet bars, being in fewer hands, have been more readily held on the agreed basis, and independent sheet mills have not had the advantage enjoyed by buyers of billets.

The future of prices on plates, structural shapes and steel bars, all of which are now under agreement, as well as of sheets, tin plate and wire products, which are directly affected by the market for Bessemer steel, is an uppermost topic among consuming interests. The expectation of lower prices in finished material has long been influential with buyers, and partly from this, but more from the lack of demand from ultimate consumers that is apparent in so many quarters, with a very considerable percentage of shop workers out of employment, rolling mill running schedules are much below normal. Railroads continue to keep their purchases at the minimum, but the expectation of good crops has created a very hopeful feeling as to the impulse that will come to the iron trade from this source later on.

Mid-summer dullness has been very much in evidence in the past week. Wire interests are preparing for a good fall demand, but there is irregularity in prices, as is to be expected at a season which emphasizes the present excess of producing capacity. Tin plate manufacturers have found little or no increase in business from the recent cut in prices, while in sheets dullness is pronounced. The taking of structural business for rolling at Buffalo, at a price below 1.60c is the most important development in structural lines. Considerable business is pending, but it has all been counted on for some weeks. The placing of the first boat for 1905 at lake shipyards revives calculations as to the plate outlook. Shipbuilding interests have intimated that a concession on steel to be used in building floating property would lead to an activity in their industry not likely under present prices.

In the pig iron market there is a better feeling, due to the williingness of larger buyers to contract for months ahead and to the fact that curtailment of production has brought output close to consumption. On Aug. 1 the active capacity in coke iron represented an output of 12¾ million tons a year, while the furnaces in blast on July 1 were producing at a rate of over 14 million tons a year. Stocks of merchant furnaces increased 47,000 tons in July and on Aug. 1 were about 850,000 tons, including charcoal iron—the largest in years. While the rate of production on Aug. 1 indicated that consumption and production of pig iron were then close together, there have been several additions to the active list both North and South this month and further additions will be made by Sept. 1. The pig iron market certainly shows more hopefulness, though the buying of the week has not been as great as in either of the two weeks preceding. Southern furnaces hold prices well, but without booking much business. Some Northern furnaces are asking more for their iron, but the increased firmness of these is balanced elsewhere by the same concessions that have been talked of in recent weeks. From $11.50 to $12 at furnace represents the position of Northern furnaces, and where any large business is done it is at the expense of prices. The last of the pig iron for the Pennsylvania tunnel castings was practically closed in the week, and a total of 54,000 tons will be divided between a large Central Western furnace interest and an important selling firm with a number of furnace connections. Bessemer iron has sold at $12 at furnace.

PITTSBURG.

OFFICE OF *The Iron Trade Review*, }
429 PARK BUILDING, Aug. 17. }

While the leading steel manufacturers insist that nothing better than the association price on billets is being named, it is well understood that $21 Pittsburg can be done on either Bessemer or open hearth, and one local concern will take any reasonable tonnage of either grade of billets at $20 Pittsburg. This is getting down pretty close to the cost of the billets to the Pittsburg Steel Co., and an official announcement of a reduction by the association is expected almost daily. On the other hand it is almost impossible to shade the price of sheet bars. Independent manufacturers have been attempting to place large tonnages during the week at reduced prices, but none of the mills would name anything below the agreed quotations. The leading steel producers have the sheet and tin bar situation under control much better than billets, as the number of mills producing sheet bars is small and only a few concerns outside of the association have this material to offer. Another meeting of the investigating committee of the billet association was held in this city yesterday and at its conclusion it was stated that billet prices remain unchanged. While some interests are attempting to convey the impression that the conversion deal made by the Republic Iron & Steel Co. has created no disturbance, just the opposite is the case.

Contracts for the pig iron for the remainder of the Pearson end of the New York tunnel castings have been placed, calling for 54,000 tons. M. A. Hanna & Co. received 27,000 tons, at a price said to net about $11.85 at the furnace, while the remainder of the iron will be shipped from Rogers Brown & Co. furnaces. The castings contracts are reported to have been divided between the Buffalo Foundry Co., Buffalo, and J. B. & J. M. Cornell, of New York. Deliveries on the pig iron is spread over about a year and a half, and it is reported that a large contract for by-product coke has been placed with the Carnegie Steel Co. for shipment from Sharon.

While other markets report increased demand and buying in foundry and forge grades, the local market continues exceedingly quiet. One inquiry for 1,000 tons of

foundry iron on which bids have been in for more than a week has not yet been placed. Another general inquiry is out for 1,200 tons of foundry, while one of the largest foundries in this district purchased 500 tons of Bessemer this week for August and September delivery at $12 at the furnace. On forge iron, $12 Pittsburg continues to be done, while basic is quoted at $11.75 at the furnace. No. 2 foundry iron is held at prices ranging from $12.60 to $12.85. For the present at least, there is nothing in the demand to warrant any advance in the iron market. While producers are holding out for somewhat higher prices for future delivery, actual transactions invariably continue to be based on the lower prices which have been prevailing for the past two weeks. Including the iron for the Pittsburg Steel Co. contract, the requirements for the tunnel castings and the iron that will be made under the revival of an old contract for Bessemer amounting to 80,000 tons, the total sales of foundry and Bessemer iron by merchant furnaces in the two valleys during the past two weeks amount to about 275,000 tons. Deliveries on the greater portion of this iron are extended through next June, while a portion will not be delivered until early in 1905. Though the total seems large, it is only enough to take three stacks out of the situation for about a year.

In finished lines the market shows little improvement. Reports of shading on plates and structural steel continue to be received. That concessions are being made is certain, but all the sales continue to be reported to the associations at the regular quotation. On iron bars 1.25c Pittsburg can be readily done, but steel bar quotations continue to be well maintained. The market on sheets is somewhat firmer, but all business continues to be closed on the basis of 2.10c for 28 gauge. The demand for wire and wire nails has improved considerably. While one of the leading wire interests reports that its "official" price has not been changed, the fact remains that $1.80 is the base to jobbers.

At Youngstown this week the Carnegie Steel Co. resumed operations at four of its iron mills, the men returning to work all working on salaries and therefore not being affected by the Amalgamated Association scale. It is believed, however, that this is only the beginning of the non-unionizing of these mills and that other departments will resume operations as soon as matters can be adjusted with the crews of the various mills.

Pig Iron.—The local market continues quiet, the transactions outside of the additional Pennsylvania tunnel business being few and of limited tonnage. The asking prices on all grades of iron are somewhat higher than have been ruling, but actual transactions are on the basis of prices prevailing in the past two weeks. On Bessemer iron for delivery the remainder of this month and September, $12 at the furnace can be done, while on forge $11.15 at the furnace is freely offered. Basic is offered at $11.75 and No. 2 foundry at $11.75 to $12. While the Southern furnaces are asking $9.50 Birmingham for No. 2, $9.25 can still be done. There has been no change in furnace operations in the Valleys in the past two weeks, apart from the resumption of Claire furnace this week, but locally the Carnegie Steel Co. has resumed at two idle stacks at the Carrie plant, thus making five furnaces in operation there and all at Duquesne, while only two out at Edgar Thomson. At Sharon all the corporation furnaces continue idle, and at Youngstown three out of four are in operation. At Bellaire and Mingo Junction the furnaces and steel plants are inoperative and prospects are not very bright for an early resumption. We make the following quotations:

Bessemer, Valley	$12 00 to 12 25
Bessemer, Pittsburg	12 85 to 13 10
No. 1 Foundry	13 00 to 13 25
No. 2 Foundry	12 65 to 12 85
Gray forge, Pittsburg	12 00 to 12 15
Chilled basic, Valley	11 75 to 11 95
Chilled basic, Pittsburg	12 60 to 12 75

Steel.—Bessemer billets are now quoted on the basis of $21 Pittsburg for delivery extending through the remainder of the year, and it is probable that $20 could be done on a desirable tonnage. On sheet bars it is practically impossible to shade the agreed prices. The sheet and tin bar situation is well in hand and is being well controlled, thus compelling the independent sheet and tin plate manufacturers to pay official prices. Agreed prices, at which practically no billets are sold, and which only establish a basis for present prices of finished materials are as follows: Bessemer and open hearth billets, 4 x 4 inches, and slabs up to and including 0.25 carbon, $23 Pittsburg, Wheeling, Valley, Johnstown, Ashland, Ky., Ironton, O., and Lorain, O.; 0.26 and including 0.60 carbon, $1 advance; and 0.61 to 1.00 carbon, $2 advance. Billets smaller than 3⅞ inches and sheets and tin bars are $1 per ton extra. Bessemer and open hearth rods are quoted at $28 to $28.50 Pittsburg.

Ferro-Manganese.—Domestic ferro, 80 percent, is held at $41 to $41.50 per ton, delivered in carload lots at buyer's mill, at any point east of the Mississippi.

Spelter.—The market continues quiet and unchanged. Prime western grades are held at 4.88c Pittsburg, in carload lots.

Muck Bar.—Prime neutral bars are held at $24 Pittsburg. There is little buying.

Skelp.—The demand for skelp continues fair, and several contracts have been closed during the week for delivery the remainder of the year. Grooved steel skelp is held at 1.32½c to 1.35c, and sheared at 1.40c. Iron grooved is held at 1.42½c and sheared at 1.47½c.

Rails and Track Material.—Light rails are now selling below the association price of billets, but this little matter has not disturbed the equanimity of the billet association according to reports. Practically no new business is being placed for standard sections. We make the following quotations: Standard sections, 50 pounds and over, in lots of 500 tons and over, $28; car lots and less than 500 tons, $30; less than car lots, $32; light rails, 16 to 40 pounds, $20 to $21. Track material, spikes, 1.60c to 1.65c.

Plates.—Concessions on plates continue to be reported, but the association mills still continue to name agreed quotations. On sizes up to 60 inches the agreed prices are shaded from $4 to $5 per ton. Leading plate consuming interests are not favorable to closing contracts at prevailing prices and intimate that concessions must be made in order to retain their trade. Agreed prices are as follows: Tank plates, ¼ inch thick and up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. B. M. A. specifications, 1.80c; still bottom steel, 1.85c; locomotive firebox, not less than 2.10c, and it ranges in price to 3c. Plates, more than 10 inches, 5c extra 100 pounds. Plates 3-16 inch in thickness, $2 extra; gauges Nos. 7 and 8, $3 extra. These quotations are based on carload lots with 5c extra a hundred pounds for less than carload lots. Terms, net cash in 30 days.

Bars.—Iron bars are now freely quoted at 1.25c Pittsburg, although the leading iron producing interest is holding out for 1.30c. Little new business is being placed either in iron or steel bars, and local mills have greatly curtailed their output. We make the following quotations: Bar iron, 1.25c to 1.30c Pittsburg for local delivery, while for Western shipments quotations are based on 1.25c to 1.35c Pittsburg. Hoops are held at 1.55c base, and bands at 1.35c taking bar extras. Bessemer steel bars, 1.35c; open hearth, 1.40c; plow beams and cultivator beams, 1.35c net; channels, angles, zees and tees, Bessemer, under 3 inches, 1.45c. The following differentials are maintained on steel: Less than 2,000 pounds of a size, not less than 1,000 pounds, 10 cents advance; less than 1,000 pounds of a size, 30 cents advance.

Structural Material.—Little new business has been placed during the week, although several large contracts are pending. We make the following quotations: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles, from 3 to 16 inches, 1.60c; universal mill plates, 1.60c.

Sheets.—The market on black sheets is somewhat firmer, 2.10c being the bottom for 28 gauge. Considerable shading is reported on galvanized and new business is light. We make the following quotations on black sheets, one pass: No. 8, 1.60c; No. 9, 1.56c; Nos. 12 to 14, 1.70c; Nos.

15-17, 1.75c to 1.80c; Nos. 18-21, 1.85c to 1.90c; Nos. 22-24, 1.95c; Nos. 25-26, 2c; No. 27, 2.05c; No. 28, 2.10c to 2.15c; No. 29, 2.35c to 2.40c; No. 30, 2.50c to 2.55c. Galvanized: Nos. 12-17, 2.20c to 2.25c; Nos. 18-21, 2.35c to 2.40c; Nos. 22-24, 2.50c to 2.55c; Nos. 25-26, 2.65c to 2.70c; No. 27, 2.90c; No. 28, 3.10c; No. 29, 3.45c to 3.50c; No. 30, 3.85c to 3.90c.

Wire and Wire Nails.—A better demand for nails and wire products has been created by the establishment of the new quotations, and a large fall trade is anticipated by the jobbers and manufacturers. As a rule, the jobbers have little on their floors and will be compelled to buy heavily to replenish their stocks. We make the following quotations: Wire nails, carload lots to jobbers, f. o. b. cars Pittsburg, $1.80 base; plain wire, carload lots, $1.70 base; barb wire, carload lots, $2.10 base; staples, carload lots, $1.95 keg. Galvanized 30 cents extra. Carload lots to retailers are held at 5 cents advance in all lines, and on less than carload lots a further advance of 10 cents is charged. Steel and iron cut nails, carload lots, $1.70, and less than carload lots, $1.75 f. o. b. Pittsburg, plus freight to point of destination. Terms, 60 days, less 2 percent off in 10 days.

Tin Plate.—Despite the recent reduction, demand has not been improved to any great extent. A majority of the mills of the leading interest continue in operation, however, while only a small percentage of the mills of the independent operators are idle. 100-pound coke plates are held at $3.30, f. o. b. mill Pittsburg, 30 days, less 2 percent cash in ten days.

Merchant Steel.—Demand has not improved and mills continue to operate at a limited capacity. We make the following quotations: Toe calk, 1.90c; carriage spring steel, 1.75c; tire steel, 1.55c to 1.60c; plow steel, 6 inches and under, 1.35c for Bessemer and open hearth; plow slabs, ¾ inch and heavier, 1.60c. Drawn and cold rolled shafting is held at 52 percent off in carload lots and 47 off in less than carload lots.

Old Material.—Heavy melting stock continues to be held at $11.50 Pittsburg by the dealers, in whose hands a large portion of the available tonnage has fallen. The large local steel interests also have large tonnages stocked, but are holding the same, preferring to use it themselves later than sell at the low prices now offered. Little scrap of any grade is moving and prices vary largely for this reason.

Coke.—The coke market has stiffened somewhat, and while it was possible to do $1.35 last week for good Connellsville furnace coke for immediate shipment, the operators are now asking $1.40 and $1.45 for delivery the remainder of the year. The non-Connellsville product of course can be had as low as $1.25, while this grade of coke for the foundry trade is selling as low as $1.60. The Connellsville product is being held firmly at $1.85 to $1.90, and several operators are securing over $2. In the two regions about 11,000 ovens continue idle, although a number are preparing to resume. During the week ending August 6, the production of the upper region reached 155,079 tons, while that of the lower region amounted to 55,338 tons.

Pipes and Tubes.—Demand for merchant pipe is somewhat better and reports of concessions are few. The aggregate tonnage offered is too small to go around and further reductions are looked for on certain sizes. Discounts to consumers, carload lots f. o. b. Pittsburg, plus freight to destination according to Tube Rate Book, are as follows:

MERCHANT PIPE.

	Steel.		Iron.	
	Black.	Galv.	Black.	Galv.
⅛, ¼ and ⅜ inch	70	55	69	54
½ inch	73	63	72	62
¾ to 3 inches	78½	68½	77½	67½
3½ to 6 inches	77	67	76	66
7 to 12 inches	72½	57	71½	56
Extra strong plain ends, ⅛ to 8 inches	69	59	68	58
Double extra strong, ½ to 8 inches	60	50	56	46

MERCHANT BOILER TUBES, LESS CARLOADS, 22 FEET AND UNDER.

	Steel.	Iron.
1 to 1½ inch	48	43
1¾ to 2¼ inches	60	43
2½ inches	62	48
2¾ to 5 inches	68	55
6 to 12 inches	60	43

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, Aug. 16.

Improvement is noticeable in the western demand for iron and steel products. Much has been expected from the fall movement, and though it has hardly set in as yet, the better tone that prevails is evidence that there will very likely be a brisk trade in the closing months of the year. The improvement is more noticeable in pig iron and the lighter forms of finished material which go into more general consumption. Present prices of pig iron are holding up well, Southern furnaces being nearly a unit in the maintenance of the $9.50 schedule, or $13.15 Chicago for No. 2 foundry; while Northern irons are held at $13.50 Chicago for the same grade.

Finished material is not in as good a condition so far as prices are concerned, and the developments in connection with the billet pool have not been conducive to any improvement in this respect. Few makers of the finished forms of steel governed by agreements are living up to published schedules, these being shaded wherever it is necessary to get the business. The action of wire producers in adopting a new schedule of prices, $2 a ton below the card last issued, was not unlooked for, as practically all the mills, including the leading maker, have for some time been quoting these prices. Inquiry for standard rails has been good during the week under review. Some structural business has been closed up, though the most interesting item in this connection is the fact that figures are now in the hands of the South Side Elevated railroad on its requirements of 25,000 tons. Bar iron is active, and while the sales are usually for small lots, there is a healthy increase in the number of orders. The mills are asking 1.35c Chicago, and the tendency is rather toward firmness. Soft steel bars are still being offered at from $1 to $2 a ton below association prices by the local harvester interest. Sheets are quiet and bottom prices seem to have been reached. There is a fair demand for tubular goods, and prices of both wrought and cast iron pipe, boiler tubes, etc., are without change. Some nice business has been closed up for special agricultural shapes in the week past for delivery during the ensuing year. Specifications against existing contracts, however, remain light. There is little change in the coke situation, fuel on track being scarce and bringing a premium of 25 cents a ton. Scrap is in better demand, several consuming interests being in the market for round lots. Prices remain stationary, and the tendency of railroads and other producers of scrap is still to withhold their material in the hope of realizing better prices later on.

Pig Iron.—Firmness characterizes the local market in the matter of prices. With one or two exceptions the furnaces in the South are asking $9.50 Birmingham for No. 2 foundry. The interests referred to as the exception are still selling at $9.25. Northern producers have also taken a firmer attitude for the maintenance of $13.50 Chicago. The demand during the past week, while heavy, shows a falling off from the sales of the week previous, the decline being attributed by some sellers to the determination of producers to uphold the above named prices. The bulk of the business placed during the week has gone to Northern furnaces, these permitting melters to cover for their requirements as far ahead as they care to buy. Some have taken advantage of this opportunity, and a round tonnage has been bought for shipment in the first quarter of 1905, though the bulk have covered only to the end of the year. Some Northern furnaces are asking $14 a ton for No. 2 iron for delivery after Dec. 31, and one local interest is also asking $13.75 on shipments in the last quarter of this year. The coal miners' strike in the South continues to handicap producers in that territory, and a determined effort is being made by the furnaces involved to break it up. Some of the affected mines were started up yesterday on the "open shop" principle, and a concerted effort will be made to operate without further dealings with the union. Lake Superior charcoal is in fair demand and prices have advanced 25 cents a ton, $14.75 Chicago now being the minimum. Our quotations follow:

Lake Superior Charcoal	$14 75 to 15 00
Northern Coke Foundry No. 1	14 00 to 14 25
Northern Coke Foundry No. 2	13 50 to 13 75
Northern Coke Foundry No. 3	13 00 to 13 25
Northern Scotch Foundry	14 50 to 15 00
Ohio Strong Softeners No. 1	14 50 to 15 00
Ohio Strong Softeners No. 2	14 00 to 14 50
Southern Coke Foundry No. 1	13 65
Southern Coke Foundry No. 2	13 15
Southern Coke Foundry No. 3	12 90
Southern Coke Foundry No. 4	12 65
Southern No. 1 Soft	13 65
Southern No. 2 Soft	13 15
Southern Gray Forge	12 40 to 12 65
Southern Mottled	12 15 to 12 40
Southern Silveries (4% to 6% Silicon)	14 85 to 15 85
Jackson Co. Silveries (8% to 10% Silicon)	17 80 to 18 30
Alabama and Georgia Car Wheel	18 85 to 19 35
Malleable Bessemer	13 50 to 14 00
Alabama Basic	13 15 to 13 40

Billets.—The local market is in a lifeless condition, few requests for more than carload lots of forging billets being heard of. Regular quotations are weak and nearly all business closed goes at a lesser figure. However, we quote association prices for Bessemer and open hearth billets, 4 x 4 and larger, up to .25 carbon, $25; up to and including .60 carbon, $1 extra; over .60 carbon, $2 extra. Billets 3⅞ in. and smaller, and sheet and tin bars, $25. Open hearth billets from store, $1.30 per 100 pounds.

Iron and Steel Bars.—There is little change to chronicle with regard to the local market. Bar iron is in good demand, and local sellers are holding firm to the minimum of 1.35c Chicago. The improvement in this material is not so much in the aggregate tonnage, as it is in the greatly increased number of orders, which come from a variety of sources and for average lots of 200 to 500 tons. Mills are optimistic as to the outlook and are selling freely for deliveries in the balance of the year. New business in steel bars is light, as practically the entire consuming trade has placed orders for requirements this year. Specifications, however, are good. The local implement interest is still shading association prices $1 to $2 a ton on the sizes of steel bars which it can roll. The market on hard steel angles made from old rail stock is in a ragged condition and local sellers are quoting as low as $1.25c to 1.30c Chicago. We quote other prices, Chicago delivery, mill shipments, as follows: Bar iron, 1.35c; soft steel bars, 1.40c to 1.51½c; soft steel angles, less than 3 x 3, 1.61½; hoops, 1.71½c. On lots from store, we quote bar iron, 1.75c base, full extras; steel bars, 1.70c to 1.80c base, half extras; hoops, 2.10c rates, full extras.

Sheets.—Business is in fair volume, though prices are irregular. We continue to quote for one pass, cold rolled, blue annealed sheets, mill shipments, Chicago delivery, as follows: Nos. 9 and 10, 1.77½c to 1.79½c; Nos. 11 and 12, 1.79½c to 1.86½c; Nos. 13 and 14, 1.86½c to 1.91½c; Nos. 15 and 16, 1.89½c to 2.01½c. On box annealed, one pass, cold rolled: Nos. 18 and 20, 2.01c to 2.06½c; Nos. 22 and 24, 2.06½c to 2.11½c; Nos. 25 and 26, 2.11½c to 2.16½c; No. 27, 2.16½c to 2.21½c; No. 28, 2.26½c to 2.31½c; No. 29, 2.41½c to 2.46½c; No. 30, 2.51½c to 2.56½c. Jobbers report a fair demand for both black and galvanized sheets from stock. Prices are without change, and we quote as follows: No. 10 and heavier, 2c to 2.10c; No. 12, 2.05c to 2.15c; No. 14, 2.10c to 2.20c; No. 16, 2.20c to 2.30c; No. 18, 2.30c to 2.40c; No. 20, 2.30c to 2.40c; No. 22, 2.35c to 2.45c; No. 24, 2.40c to 2.50c; No. 26, 2.50c to 2.60c; No. 27, 2.60c to 2.70c; No. 28, 2.70c to 2.80c; No. 29, 2.85c to 2.95c. Galvanized sheets are quiet, and we quote Pittsburg discounts, f. o. b. mill, 80 and 5 to 80 and 10. For shipments from local store, 75, 10 and 5 to 80 percent.

Structural Material.—Several orders have been placed with mills during the week, though the aggregate tonnage is not of large proportions. The South Side Elevated railroad is expected to place contracts soon for the construction of its extension, requiring 25,000 tons, the figures being now in the hands of its officials. Prices are without change, and we quote carload lots, Chicago delivery, mill shipments, as follows: Beams and channels, 16 inches and under, 1.76½c; 18 inches and over, 1.86½c; universal plates, 1.76½c; angles, 3 x 3 and larger, 1.81½c; zees, 1.76½c. On lots from store, we quote beams, channels and angles, 3 x 3 and larger, 2c; beams, 18, 20 and 24-inch, 10c extra; tees, 2.05c rates.

Plates.—A moderate amount of business continues to be placed with Western interests, though the tonnage is nothing big. Shading of regular prices is reported frequently. We quote "official" prices on carload lots, mill shipments, Chicago delivery, as follows: Tank steel, ¼ inch and heavier, 1.76½c; flange steel, 1.86¼c; marine, 1.90½c; universal mill plate, 1.76½c to 1.81½c; 3-16-inch, 1.86½c; Nos. 7 and 8, 1.19½c; No. 9, 2:10½c; No. 10, 1.91½c; No. 11, 1.96½c; No. 12, 2.01½c. From store, we quote tank steel ¼-inch and heavier, 2c; 3-16, 2.10c; No. 8, 2.15c; No. 10, 2.15c; flange steel, 2.25c, all f. o. b. warehouse.

Rails and Track Supplies.—A good inquiry for standard sections has developed during the week under review, ranging in lots from 40,000 tons down, though little of this tonnage is expected to be placed for some time. Light rails are in good demand, but prices are weak and some mills reported to have sold lots as low as $18 and $20 at the works. Track supplies are active, and consumers are taking full quotas against their contracts. We quote, heavy sections, mill shipments, as follows: 500 tons and over, $28; less than 500 tons to carload lots, $30; less than carload lots, $32; second quality rails, $27; light rails, $22 to $24; track supplies, f. o. b. Joliet mill, angle bars, 1.35c; spikes, first quality, 1.65c to 1.75c; track bolts, 3½ x¾, with square nuts, 2.20c to 2.30c per 100 lb.; with hexagon nuts, 2.35c to 2.45c.

Merchant Pipe.—The improvement noted last week continues in evidence, though it is largely in the shape of specincations. Practically the entire Western trade covers once a year for its annual requirements, and after this period of buying is passed new business is generally light. Prices are unchanged. We quote carload lots, mill shipments, random lengths, f. o. b. Chicago, as follows:

MERCHANT PIPE.

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed Wrought Iron Pipe. Black. Percent.	Guaranteed Wrought Iron Pipe. Galv. Percent.
⅛ to ¾ inch	68.35	53.35	67.35	52.35
½ inch	71.35	61.35	70.35	60.35
¾ to 3 inches	76.85	66.85	75.85	65.85
3½ to 6 inches	75.35	65.35	74.35	64.35
7 to 12 inches	70.85	55.35	69.85	54.35

Boiler Tubes.—There is a brisk demand for tubes and jobbers are doing a better business in this product than in some months. We quote carload lots, mill shipments, Chicago delivery, as follows:

BOILER TUBES.

	L. W. Steel. Percent.	C. C. Iron. Percent.	Seamless Steel. Percent.
1 to 1½ inch	46.35	41.35	52.35
1¾ to 2¼ inch	58.35	41.35	40.35
2½ inch	60.35	46.35	43.35
2¾ inch to 5 inch	66.35	53.35	Up to 4 inches.
6 to 13 inch	58.35	41.35	50.85

The following are the agreed discounts from store, Chicago:

	Steel.	Iron.	Seamless Steel.
1 to 1½ inches	42½	37½	40
1¾ to 2½ inches	52½	35	37½
2½ inches	55	37½	40
2¾ to 5 inches	62½	47½	47½
6 inches and larger	52½	35	..

Merchant Steel.—The week under review has seen the closing up of several yearly contracts for special shapes. Specifications are light, though not unusually so for this time of the year. Prices are without change, and we quote carload lots, mill shipments, Chicago delivery, as follows: Spring steel, 1.90c, sleigh shoe, flat sizes, 1.56½c; concave and convex, 1.7[illegible] shoe, 2.25c; smooth finished machinery steel, [illegible]se; smooth finished tire, 1.71½c; plow steel, 2.20c a[illegible]ward according to quality; toe calk, 2.06½c base. Ordinary grades of crucible tool steel, 6½c to 8c; special tool steel, 12c up. Cold rolled shafting, 52 percent from list in carload lots, and 47 percent discount in less than carload lots.

Cast Iron Pipe.—Producers report the current business of fair proportions, but this is not marked by any large sales. Prices are firm, and we quote 4-inch water pipe, $25.50; 6-inch to 12-inch, $24.50; larger sizes, $24; gas pipe, $1 a ton higher.

Wire Products.—There is a fair demand for wire nails and other wire products, although the trade is passing through a seasonable dullness. Information in regard to current prices is difficult to obtain, in view of the irregularity of the market, but it is understood that the interests

represented at the recent meeting of manufacturers held in this city agreed on a schedule substantially $2 per ton below that which was in force before the cutting of prices commenced, thus making regular the prices which had been in force as concessions for some time. The American Steel & Wire Co., however, states that it has not changed its "official" prices, and has no intention of doing so, although it is meeting the competition of other manufacturers. In view of the ragged condition of the market and the variety of prices ruling we continue to quote the old schedule with the reservation that these prices can be shaded from 10 to 15 cents per hundred pounds on carload lots with any manufacturer and that special prices less than these concessions can be obtained on larger quantities. Wire nails, carload lots, $2.10; less than carload lots, $2.15; cut nails, carload lots, 1.80c to 1.85c; less than carload lots, 1.96½c; smooth wire, carloads, $2, and $2.05 for less than carload lots; galvanized smooth wire, $2.30 in carloads and $2.35 in lesser amounts; painted barb wire, $2.40 carloads, and $2.45 in less than carload lots; galvanized barb wire, $2.70 carloads, and $2.75 less than carload lots. Staples, polished, carloads, $2.25; less than carload lots, $2.30; galvanized, $2.55 carloads and $2.60 less than carload lots. Bale ties, 82½ and 5 percent discount f. o. b. Waukegan, Ill., on straight carload lots. Poultry netting, 85 and 5 percent discount from list f. o. b. Joliet or DeKalb, with actual freight allowed not exceeding 50 cents per 100 pounds.

Foundry Coke.—There is a fair demand for coke in carload lots. Fuel on track is scarce and spot delivery now brings a premium of 25 cents a ton. Prices on standard 72-hour foundry grades, whether Connellsville or Southern, range from $1.85 to $2 at the ovens.

Old Material.—Some demand for large tonnage has come to the front in the last few days from western mills. No idea, however, as to figures is obtainable. Prices are practically stationary. Transactions during the week have not been numerous. We quote dealers' selling prices, gross tons, as follows:

Old iron rails	$15 00 to 16 00
Old steel rails (4 feet and over)	11 00 to 11 50
Old steel rails (less than 4 feet)	10 00 to 10 50
Relaying rails, subject to inspection	21 50 to 22 50
Relaying rails for sidetracks	18 00 to 20 00
Old wheels	11 00 to 12 00
Heavy melting steel	9 50 to 10 00
Mixed country steel	7 00 to 7 50

The following quotations are for net tons:

Low phosphorus scrap (.04 and under)	$12 00 to 13 00
No. 1 R. R. wrought	11 00 to 11 50
No. 2 R. R. wrought	9 50 to 10 00
Shafting	12 50 to 13 00
Dealers' Forge, No. 1	8 00 to 8 50
Wrought pipe and flues	7 50 to 8 00
No. 1 cast, 150 lb. and less	9 50 to 10 00
Heavy cast	8 00 to 8 25
No. 1 mill	6 00 to 6 50
Country sheet	5 00 to 5 50
No. 1 boilers, cut	7 50 to 8 00
Boiler punchings	9 00 to 9 50
Iron car axles	15 00 to 16 00
Steel car axles	13 50 to 14 00
Iron axle turnings	7 00 to 7 50
Steel axle turnings	7 00 to 7 50
Cast borings	4 00 to 4 50
Mixed borings, etc.	4 00 to 4 50
Wrought turnings	7 00 to 7 50
Machine shop turnings	7 00 to 7 50
Railroad malleable	8 25 to 8 75
Agricultural malleable	7 75 to 8 00
Stove plate and light cast scrap	8 00 to 8 50
Old iron splice bars	13 00 to 13 50

CLEVELAND.

OFFICE [illegible] *Iron Trade Review,* BUILDING, Aug. 17.

Iron Ore.—A considerable tonnage of ore has been sold during the past week. No unsold ore is being shipped and the space on lower lake docks is limited. Hence furnaces realize the necessity of provid[illegible]g for their requirements and are showing more disposition to buy. Prices are being pretty well maintained, as there is a general disposition among merchant ore firms not to go below recent quotations, which are $3 to $3.25 for old range Bessemer and $2.75 to $2.80 for Mesabi Bessemer, while non-Bessemers sell at $2.50 to $2.70 for old range and $2.25 to $2.35 for Mesabi. The freight rate from the head of the lakes has settled to 65 cents after being 70 cents for many weeks. The rates from Marquette and Escanaba remain at 60 and 50 respectively.

Pig Iron.—Demand continues very fair, but there is a good deal of irregularity in prices. Although a considerable number of furnaces are holding for $12 for No. 2 foundry at the stacks and succeed in selling at that figure, iron can still be bought at $11.75 and even $11.50 has been done. Southern is firm at $9.25 to $9.50 Birmingham for No. 2, but few sales have been made in this territory. Orders for shipments on old contracts on which shipments have been delayed by request of buyers are coming in freely. The principal sale of Northern was the last 54,000 tons required by makers of castings for the Pennsylvania tunnels, a Cleveland firm taking half of the order. This firm now has contracts for 80,000 tons of the pig which will go into the tunnel castings. We quote as follows for Cleveland delivery:

Bessemer	$12 60 to 12 75
No. 1 Strong Foundry	12 85 to 13 00
No. 2 Strong Foundry	12 60 to 12 85
No. 3 Foundry	12 25 to 12 50
No. 2 Southern	13 10 to 13 25
Gray Forge	12 15 to 12 25
Gray Forge, Southern	12 00 to 12 15
Lake Superior charcoal	14 50 to 15 00

Finished Material.—The discussion of the conversion contract of the Republic Iron & Steel Co. and the Pittsburg Steel Co. has continued with depressing effect, but buyers who expected a general reduction in prices of steel products now find little upon which to base such hopes. Nothing new that is authentic is known concerning lower quotations and indications do not point to such changes in the near future. The bar iron market is irregular and demand moderate, the price ranging from 1.25c to 1.30c at the mill. Business in steel bars at 1.44½c Cleveland for Bessemer and 1.49½c for open-hearth is quiet, but specifications are coming in freely on contracts made last March and April. Jobbers report a very satisfactory week in sales of sheets. The prices of the principal producers through jobbers are as follows, Cleveland delivery, the freight from Pittsburg being 9½ cents: Mill sales of black sheets in carload lots, No. 10, 1.74½c; No. 11-12, 1.79½c; No. 14, 1.84½c; No. 16, 1.94½c; No. 27, 2:19½c; No. 28, 2:29½c. Galvanized, mill sales, No. 14, 2:29½c; No. 16, 2:39½c; No. 18-20, 2:54½c; No. 22-24, 2.69½c; No. 25-26, 2:89½c; No. 27, 3.09½c; No. 28, 3.29½c. Black sheets out of stock; ¼-inch, 1.90c; 3-16-inch, 2c. Blue annealed: No. 10, 2.05c; No. 12, 2:10c; No. 14, 2:15c; No. 16, 2.25c. One pass cold rolled: No. 18-20, 2.35c; No. 22-24, 2.40c; No. 26, 2.45c; No. 27, 2.50c; No. 28, 2.60c; No. 30, 3c. Galvanized out of stock: ¼-inch, 1.90c; 3-16-inch, 2c. Blue annealed, No. 10, stock: No. 16, 2.60c; No. 18-20, 2.70c; No. 22-24, 2.85c; No. 26, 3.05c; No. 27, 3.25c; No. 28, 3.45c; No. 30, 4.25c.

Old Material.—The tone of the market is better and dealers argue that resuming mills will soon be compelled to place orders for scrap, but as yet buying is very slow and prices have not advanced. Some dealers have large stocks on hand, having purchased with the belief that prices had struck bottom. We quote as follows for Cleveland delivery:

Old iron rails	$14 50 to 15 00
Old steel rails (over 6 feet)	12 00 to 13 00
Old steel rails (under 6 feet)	11 00 to 12 00
Old car wheels	10 00 to 11 00
Steel boiler plate	9 00 to 10 00
Malleable iron (railroad)	9 50 to 10 00
Malleable iron (agricultural)	8 00 to 9 00
Heavy steel	9 50 to 10 50

We quote as follows, net tons:

No. 1 R. R. wrought	$10 00 to 11 00
No. 1 busheling	9 00 to 9 50
No. 1 machine cast	9 50 to 10 50
Iron axles	15 00 to 16 00
Axle turnings	7 00 to 8 00
Wrought turnings (free from cast)	6 00 to 6 50
Grate bars	7 00 to 8 00
Pipes and flues	8 00 to 8 50
Tank iron	7 50 to 8 50
Hoop and band iron	5 00 to 5 50
Sheet iron	4 00 to 5 00
Wrought drillings	6 00 to 6 50
Stove plate	7 50 to 8 00
Steel axles	13 00 to 14 00
Cast borings	3 50 to 4 00

CINCINNATI.

August 16.

The coke market is reported as somewhat more active, but there is no quotable change in prices. For foundry

coke the going prices are $1.80 to $2.10 f. o. b. Connellsville. In furnace coke the market is firmer, as there is more inquiry from Birmingham for Virginia coke to run the furnaces pending the settlement of the coal strike.

Pig Iron.—The market the past week has made but little change and as to tonnage sold there is perhaps a slight falling off as compared with the three preceding weeks. There have been no large transactions closed and the bulk of the business has been confined to orders from carloads up to 500 tons. There is one inquiry in the market for 3,000 tons of No. 2 and No. 3 foundry for delivery in the first six months of next year. Prices of Northern irons are easier and $11.50 furnace for No. 2 foundry has been quoted. At the same time Northern Ohio furnaces are reported to be rather firmer. The position of the Southern producers remains unchanged and $9.25 Birmingham for No. 2 foundry is the lowest quotation now obtainable on Southern iron. The lower grades are slightly firmer. The attitude of the Southern makers in refusing to meet Northern competition is explained by the fact that the Southern furnace interests are now able to dispose of about all the iron they are making, hampered as they are by the strike conditions prevailing in the Birmingham district. Advices from Birmingham are that two of the leading furnace companies are determined to fight the strike to the end and are figuring on buying Virginia coke to get their furnaces in operation. Another of the large companies will make the attempt to operate its mines with non-union labor. It is also stated that some of the furnaces are buying coal from some of the coal companies that have made temporary arrangements with the men, and are thus keeping the coke ovens going. These coal companies are collecting money from their men on behalf of the union and it is a peculiar situation that the coal thus mined is going to companies whose miners are out on strike. This shows that the situation so far as the strike is concerned is rather mixed and a date for the settlement of the difficulty is hard to name. The efforts of the furnaces to buy Virginia coke have resulted in putting up the price from $1.30 at ovens to $1.60 per ton and it is thought by some that the advance will make the use of this coke prohibitory. In the meantime Northern furnaces have practically no competition in central territory and are urging their product actively to the detriment of prices in some instances. Traveling men report buyers as in the mood to take on iron at present prices in moderate quantities. Consumption shows some increase, as is indicated by reports of more liberal specifications on contracts. There is some inquiry for Northern silvery iron with the prices at about $15 furnace. The lower grades of iron continue in light supply. The leading interest in cast iron pipe has been a buyer right along of odd lots and has taken in the neighborhood of 5,000 tons in this way during the week. We quote in carload lots f. o. b. Cincinnati:

Southern Foundry No. 1	$12 50 to 12 75
Southern Foundry No. 2	12 00 to 12 25
Southern Foundry No. 3	11 50 to 12 00
Southern Foundry No. 4	11 00 to 11 25
Southern Foundry No. 1 soft	12 50 to 12 75
Southern Foundry No. 2 soft	12 00 to 12 25
Gray Forge	11 00 to 11 25
Northern Foundry No. 1	13 15 to 13 65
Northern Foundry No. 2	12 65 to 13 15
Southern car wheel iron	16 25 to 16 50

Manufactured Material.—There has been no noticeable change in the market and demand is reported as improving as compared with last month. Bar iron is still quoted at 1.40c and is regarded as steady at that quotation. Steel bars are quoted at 1.48c, half extras, with dealers quoting 1.75c to 1.90c for iron and steel out of store. Galvanized sheets are being quoted at 75 and 10 to 75, 5 and 2½ percent off. We quote black sheets, No. 27, at 2.30c in car lots of 500 bundles. Black sheets out of store are selling as follows: No. 28, 2.70c; No. 27, 2.60c; No. 16, 2.35c; No. 14, 2.25c; No. 12, 2.16c; No. 10, 2.05c. Tank plates are dull and sell out of store at 2c for ¼-inch and 2.10c for 3-16-inch. Beams and channels are quoted at 2c from stock and angles at 1.90c to 2c for base sizes.

In merchant pipe the market is unchanged and rules quiet with independent mills still taking the bulk of the business at shaded prices. Schedule prices for car lots f. o. b. Cincinnati are as follows:

MERCHANT PIPE.
(Basing Discounts.)

	Steel Pipe. Black. Percent.	Steel Pipe. Galv. Percent.	Guaranteed Wrought Iron Pipe. Black. Percent.	Guaranteed Wrought Iron Pipe. Galv. Percent.
⅛, ¼, ⅜ inch	68.7	53.7	67.7	52.7
½ inch	71.7	61.7	70.7	60.7
¾ to 2 inch, inclusive	77.2	67.2	76.2	66.2
2½ to 6 inch, inclusive	75.7	65.7	74.7	64.7
7 to 12 inch, inclusive	71.2	55.7	70.2	54.7

BOILER TUBES.

	Steel Percent.	Iron Percent.
to 1½ inch	41.2	37.7
1¾ to 2¼ inch	54.2	36.7
2½ inch	56.7	41.7
2¾ to 5 inch	63.2	49.2
6 to 13 inch	54.2	36.7

Old Material.—The market shows no important change, but the tone is steadier and there is a shade more inquiry. Prices are not quotably different from last week. We quote:

Old No. 1 railroad wrought, net tons	$11 00 to 11 50
Cast machine and foundry, net tons	9 50 to 10 00
Old iron rails, gross tons	12 50 to 13 00
Old steel rails, gross tons	9 50 to 10 00
Old short lengths, gross tons	10 00 to 10 50
Old iron axles, net tons	13 50 to 14 00
Stove plate, net tons	6 00 to 6 50
Wrought turnings, net tons	6 00 to 6 50
Cast borings, net tons	3 00 to 3 50

PHILADELPHIA.

August 16.

Business in considerably larger volume than for a number of weeks has been transacted during the past week. The feeling is better, but prices show little change. The increased demand for structural material and railway equipment is encouraging, although orders are not very large.

Pig Iron.—Orders have been placed freely and sellers are encouraged to believe that the improvement will continue. Reports from Western connections are favorable. Prices are about the same. We quote as follows: No. 1 X foundry, $14.75 to $15.25; No. 2 X foundry, $14.25 to $14.50; No. 2 plain foundry, $13.50 to $13.75; standard gray forge, $13 to $13.25; ordinary gray forge, $12.50 to $12.75; basic, $12.75 to $13.

Finished Material.—Business has improved, but there is some uncertainty as to prices and the lack of stability of pools is evident. Consumption is increasing, but buyers are placing orders with much caution. Prices are unchanged, as follows: Beams, channels and angles, 1.72½c to 1.85c, according to specifications, and small angles, 1.50c to 1.55c. Plates, 1.73½c for ¼-inch, with the usual advance on extras. Bars, 1.48½c and upward, for either steel or refined iron.

Old Material.—There is still little activity and prices are not quotably different. We quote as follows: No. 1 steel scrap, 11.50 to $12; low phosphorus scrap, $16 to $16.50; old steel axles, $14.50 to $15; old iron axles, $17.50 to $18; old iron rails, $13.75 to $14.50; old car wheels, $10.50 to $11; choice railroad No. 1 wrought, $13 to $13.50; machinery cast, $11.50 to $12.25; No. 2 light scrap (forge), $9 to $9.50; No. 2 light scrap (ordinary), $7.50 to $7.75; axle turnings, $9 to $9.50; wrought turnings, $8.50 to $9; cast borings, $6 to $6.50; stove plate, $8.50 to $9.25; wrought iron pipe, $9.50 to $10.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., Aug. 16.

Pig Iron.—The market in the past week has been a featureless one. If anything, sales in the aggregate have shown a falling off as compared with the week previous, with Southern irons leading in this respect. The prices for Southern grades continue firm, it being rare that an order for Southern No. 2 foundry is placed at less than $9.50 Birmingham. But neither producer nor consumer is anxious to do business at $9.50, both evidently being committed to a "stand pat" policy. For lower grades, Southern makers report an increased demand, and prices for these are firmer now than they have been in months. In Northern irons the tendency of furnaces to restrict

production to the demand has steadied prices a trifle, but a good order would undoubtedly result in concessions. Not in some time have foundrymen been running closer to stocks than at present, and it is only when they are forced to replenish them that the market shows a little activity. The general run of buyers are purchasing in a hand-to-mouth way, and do not care to contract for forward delivery. Definite news is still unobtainable concerning the contract for the second half of the Pennsylvania East River tunnel castings, though it is understood it is to be divided between a Buffalo and a New York foundry. New York pig iron quotations at tidewater follow: Northern No. 1 X, $14.50 to $15; No. 2 X, $14 to $14.50; No. 2 plain, $13.50 to $14; Southern No. 1 foundry, $13.50 to $13.75; No. 2 foundry, $13 to $13.25; No. 3 foundry, $12.50 to $12.75; No. 4 foundry, 12 to $12.25.

Finished Iron and Steel.—Business in structural shapes was very quiet during the past week. There were no contracts of any magnitude placed, and orders for small lots did not amount to much in the aggregate. Recent reports of cuts in steel, the building strike in this city, and the low prices quoted by independent companies, have all combined to exert a depressing effect on the structural material trade. Bars are quiet, pending the outcome of a meeting which is expected to be held in this city next week, although no change in prices is anticipated. Sheets continue irregular, with business slacker than in weeks, because of the building strike. Plates are a little more active, with the mills anxious for orders. New York prices are as follows: Beams and channels, 15-inch and under, 1.75c to 1.90c; angles, 3 to 6 inches, 1.75c to 1.90c; zees, 1.75c to 1.90c; bulb angles, 2.05c to 2.35c; deck beams, 2.05c to 2.35c; sheared steel plates, tank, 1.74½c to 1.80c; flange, 1.84½c to 1.90c; firebox, ordinary, 1.94½c to 2c; refined iron and soft steel bars, 1.49½c; sheets, in carload lots New York, No. 28, black, 2.30c to 2.35c; galvanized, 3.30c to 3.35c.

Old Material.—There have been no developments in the past week. Very little material is changing hands, this being principally due to holders asking prices considerably in advance of those they named a few weeks ago. The feeling is decidedly hopeful. Heavy steel scrap, while not so much in demand, maintains its strong position. Heavy cast scrap is in better demand at higher prices. Other branches of the old material market are without special feature. Prices per gross ton, f. o. b. cars, follow:

Old iron rails	$14 00 to 14 50
Old steel rails, long lengths	11 75 to 12 50
Old steel rails, short pieces	11 00 to 11 50
Relaying rails	19 00 to 20 00
Old car wheels	11 50 to 12 50
Old iron car axles	17 00 to 18 00
Old steel car axles	14 00 to 14 50
Heavy melting steel scrap	11 50 to 12 00
No. 1 railroad wrought scrap	11 50 to 12 00
Iron track scrap	10 50 to 11 00
Wrought pipe	7 75 to 8 25
Ordinary light iron	4 50 to 5 25
Cast borings	3 50 to 4 00
Wrought turnings	5 50 to 6 00
No. 1 machinery cast	9 00 to 10 00
Stove plate	7 50 to 8 25

BIRMINGHAM.

BIRMINGHAM, Ala., Aug. 15.—Alabama furnace operators are beginning to increase their pig iron production. In the past week the Tennessee Coal, Iron & Railroad Co. started up its Oxmoor furnace, after an idleness of nearly three weeks, coke being brought from Virginia. The Alabama Consolidated Coal & Iron Co., which signed a temporary contract with the union miners, started up one Ironton furnace last week and this week will start up a second Ironton and also the Gadsden furnace. It is given out that the Woodward Iron Co. will start to make iron at one of its Woodward furnaces this week and the Republic Iron & Steel Co. may be able to start its No. 3 furnace at Thomas. The Lookout Mountain Iron Co., at Battelle, will be delayed a little in starting its furnace.

There is a good demand still for iron in this section and prices are firm, No. 2 being held at $9.50. Sales aggregate more than the production, which explains the efforts to start up furnaces. Second Vice President J. W. McQueen, of the Sloss-Sheffield Steel & Iron Co., states that there is a fair demand for iron and that the production is being taken up right along. The Sloss-Sheffield Steel & Iron Co., despite the strike at the coal mines, has kept six furnaces in steady operation and it is given out authoritatively that the company sold 30,000 tons of coal in July on the open market. Stocks of iron in this district are not as large as they have been.

The following quotations are given by Southern iron manufacturers: No. 1 foundry, $10; No. 2 foundry, $9.50; No. 3 foundry, $9; No. 4 foundry, $8 to $8.50; gray forge, $8 to $8.50; No. 1 soft, $10; No. 2 soft, $9.50.

There is no change in the rolling mills situation hereabouts, the bar and plate mills of the rolling mills at Bessemer being in operation with non-union men. The production at this plant is not very heavy. Considerable finished product is being shipped by the rolling mills hereabouts from stock accumulated before the shut-down several weeks ago. The Amalgamated Association in this district has named Ben Davis, a local attorney, as its member of the conciliatory board which will shortly take up the matter of a new wage scale with the Republic Iron & Steel Co.

The furnace companies in this district whose mines are affected by the strike have given notice that they propose to open their mines as "open shop" and are now introducing non-union labor. A large force of deputy sheriffs is now at the mines to protect property and the lives of men who desire to return to work. There will be a heavy importation of non-union labor to the district during the present week.

The Cannon Pump Mfg. Co. is moving its works from Waycross, Ga., to North Birmingham, and in a short time now the plant will be ready for operation. R. C. Cannon states that he will purchase malleable castings in Ohio, while the ordinary castings will be bought in the Birmingham district. Mr. Cannon suggests that this is a desirable locality for a malleable castings plant, only one being located in the Southern States.

The Metal Market.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
1164 MONADNOCK BLOCK, Aug. 16.

There is little life to the local metal market and demand seems to have reached its lowest ebb. Material is plentiful and prompt deliveries can be had without difficulty. Prices remain stationary, although it is hard to tell just how much of a concession would be made on a good-sized order. Certainly on such an one the following quotations could be bettered. However, on carload lots we quote: Lake copper, 13c, and for smaller lots 13¼c; casting, 12⅝c for carloads and 13c for less than carload lots. Pig tin has declined a point, and is now quoted at 28¼c to 28¾c, according to quantity. Spelter is easy at 5c to 5¼c in carload lots; sheet zinc is without change at 6c for carload lots of 600-pound casks, and 6.25c to 6.35c for less than carload lots. Pig lead is quoted at 4.10c for 50-ton lots, 4.15c for carload lots and 4.25c for lesser quantities.

There is a fair demand for old metals, although the market is without features of interest. The following prices are ruling today: Copper wire and heavy, 10¼c; copper bottoms, 9¼c; copper clips, 10c; red brass, 9¼c; red brass borings, 7¼c; yellow brass, heavy, 7c; yellow brass borings, 6c; light brass, 5c; tea lead, 3¼c; zinc, 3.40.

NEW YORK.

OFFICE OF *The Iron Trade Review*,
ROOM 1315, No. 150 NASSAU ST., Aug. 16.

Pig Tin.—While today's closing prices are a trifle higher than those which prevailed a week ago, the metal was inclined to decline during the past week. In trade circles complaints of poor business are plentiful, with the immediate future offering little hope for improvement. In London the market has been fairly active, with prices showing a reactionary tendency. Closing prices today follow: Spot, 26.90c to 27.00c; August, 26.80c to 26.95c; September, 26.75c to 26.90c. London's closings today follow: Spot, £121 15s; future, £122 5s. Arrivals at Atlantic ports for the month to date aggregate 2,205 tons, with 1,764 tons afloat.

Copper.—Prices remain unchanged, but there has been no activity during the past week. The export trade is still the redeeming feature of the situation, and this alone is responsible for the strength in values. In London the market was active, with prices showing an upward trend. Closing prices today follow: Lake and Electrolytic, 12½c to 12¾c; casting, 12¼c to 12½c. London's closing today follows: Spot, £57 1s 3d; futures, £57 2s 6d. Exports for the month to date aggregate 8,246 tons.

Lead.—Is quiet with prices a trifle lower, spot being 4.15c to 4.20c. St. Louis is weaker at 4.00c London advanced to £11 16s 3d.

Spelter.—The market is dull and unchanged at 4.85c to 4.95c for spot. St. Louis remains at 4.75c. London is stronger at £22 7s 6d.

Antimony.—Both Cookson's and Hallet's are 7.00c asked. Other grades are 6.00c asked.

Quicksilver.—We quote $42.50 per flask of 76½ pounds in lots of 100 flasks. London is £7 15s.

Nickel.—Sales are made at 40c to 47c for large lots down to a ton, and at 50c to 60c for smaller quantities.

STEEL SITUATION UNCERTAIN.

(Special Telegram.)

PITTSBURG, Aug. 17.—Conferences between representatives of members of the billet association continue to be held here and in New York, discussing the situation that has resulted from the conversion deal of the Pittsburg Steel Co. and the Republic Iron & Steel Co. Efforts to compel a division of the tonnage involved in this contract are thus far fruitless and there is no telling what will happen before the end of the week. Several manufacturers predict an open market on billets within a very few days, intimating that no settlement is in sight on existing differences. With the billet market open, reductions on plates and structural steel are expected to follow, as well as on steel bars. The situation is critical and the general feeling is that prices on products controlled by associations will come down in proportion with the reductions on pig iron. Bessemer pig iron for August and September delivery is $12 at Valley furnace and this could be shaded from 10 to 15 cents a ton.

The sheet bar situation, on the other hand, is held strongly, and it is believed that if reductions are made all along the line the spread between sheet and tin bars and billets will be greatly increased, which would be favorable to a maintenance of higher prices on the products of the American Sheet & Tin Plate Co.

A considerable reduction in wire and wire nails is reported today, but at this writing cannot be confirmed.

Next President of the Iron and Steel Institute.

It is considered likely that Robert A. Hadfield, of Hadfield's Steel Foundry Co., of Sheffield, Eng., will succeed Andrew Carnegie as president of the Iron and Steel Institute. The formal announcement will probably be made at the meeting of the institute in this country in October. Mr. Hadfield was manager of the Attercliffe Works at the age of 20 and has been prominent in the steel industry for many years. He has contributed many notable papers on steel alloys, particularly in connection with manganese and tungsten, and quite recently had a patent allowed in this country on a method of producing a magnetic material of high permeability and low hysteresis action. It consists in alloying a magnetic substance with silicon, reducing the alloy to a thin body, heating the thin body to a temperature below its melting point, allowing it to cool quickly, reheating it to a temperature above that first employed and again allowing it to cool.

The Acme Wire Co., recently incorporated, of Cuyahoga Falls, O., will take over the entire holdings of the Cuyahoga Wire & Fence Co. It is expected that every department of the plant will be in operation within a few weeks.

AN IRON MANUFACTURER'S PHILOSOPHY.

One who has for years been actively identified with the iron trade in the Central West, but is for the time being an onlooker, writes to the editor of *The Iron Trade Review* in a somewhat satirical vein on the happenings of the past few years, and the lessons they have taught. While the letter was not intended for publication, we present a few extracts from it:

"Up in this bracing air where brain food is delicious and cheap, and where the microbe of letter writing inoculates the soul, some of the lessons taught by the experience of the past five years suggest themselves:

"We have learned that the saying wrongfully attributed to a great man, 'This is a new era, history does not count,' has caused more losses on paper than the civil war.

"We have learned that not only did history count but that thinly margined good people were 'counted out' by the thousands.

"We have learned that what goes up too high is sure to fall too low, and that the swing of the pendulum is the same old swing on the same old pendulum.

"We have learned that the place to make steel is where good coke meets Lake ore traveling in opposite directions, and not where Wall Street meets Broad street traveling at right angles (with an uptown branch where Fifth avenue meets 34th street).

"We have learned that where properties that never earned a dollar but what should have gone and did go to maintenance, were capitalized for millions, you could not expect 7 percent on the preferred and 20 on the common with quite the same regularity that Government bonds pay interest.

"We have learned that if some of the trips between the Central West and New York had been omitted, the travelers would have been short a lot of fun, but the companies' treasuries would have been long a lot of cash.

"We have learned that the richest country on earth could not reconstruct all its railroads and undertake other new enterprises at the same time without causing some slight stringency in the money market.

"We have learned that maintaining prices above reasonable value does not increase consumption, but that by so doing the producer carries all stocks, the consumer none.

"We have learned that most people paint their house and put in a new bath tub in the same year, and that nothing on earth will ever change this phase of character.

"Labor has learned that it has to work while it is working, and must desist during working hours from discussing with the walking delegate the latest novel or the Hay-Pauncefote treaty.

"The Canadians have learned that raising wheat in Manitoba is golden, but that making steel out of alumina and sulphide of iron is a frost. * * * *

"Here we are back to earth again, having completed the longest, highest and to some the most pleasurable balloon ascension on record, ready for another one, which the older generation, let us hope, will handle without such serious consequences."

Chas. M. Schwab has given out a statement in which he says there is no essential credit in dying rich. He believes in industrial schools and says that he and Mrs. Schwab intend to use a considerable part of their fortune in establishing such schools, having in view especially the education of crippled and deformed children. He said in part: "I have observed during my connection with the steel industry that the tendency nowadays is for young men to have an ambition to get out of manual labor—work with the hands—and become engineers, electricians and professional men. The crying need of today is that young men be taught useful work to do with their hands."

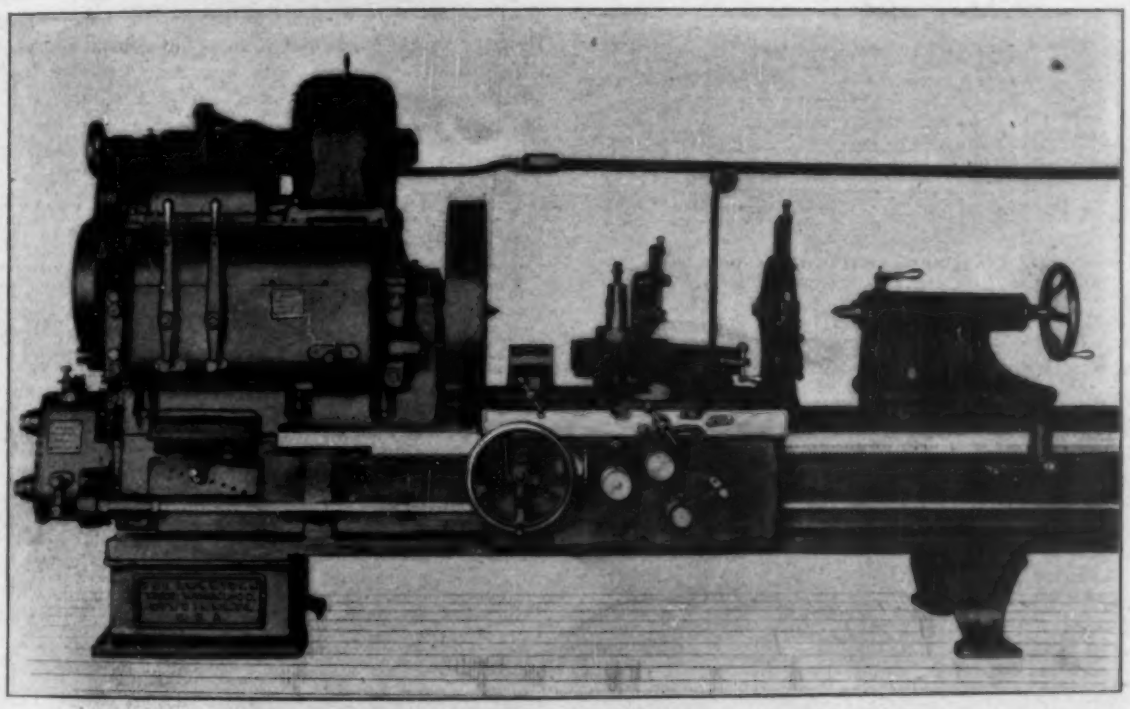
The National Electric Co., successor to the Christensen Engineering Co., Milwaukee, manufacturer of Christensen air brakes and electrical machinery, has just completed extensions to its foundries, and is taking contracts for open-hearth and crucible steel, semi-steel, iron and brass castings.

ENGINE LATHE WITH MOTOR DRIVE.

The American Tool Works Co., of Cincinnati, builds a 30-inch engine lathe which is equipped with an interesting method of motor drive. A feature of this drive is that the motor employed is of constant speed type. The great majority of motor-driven lathes are equipped with variable speed motors, even though at much greater expense. In this instance, a constant speed motor, either direct or alternating current, is used, and the various speeds to the spindle are obtained mechanically through the all-geared headstock. This consists essentially of patented clutch and gear mechanism, which employs a minimum amount of gears and shafts, and is a simple, efficient and practical drive. Through manipulation of the levers 1 and 2, shown at the front of head, and 3, shown at the lower right corner of the head, sixteen distinct and positive speeds to the spindle are provided, in geometrical progression ranging from 3.8 to 246. Thus a wide range is obtained entirely through mechanical means and sufficient to cover the ordinary work of the lathe. By reason of the simplicity of construction all gears and shafts can be made of large diameters. The whole is neatly encased and all parts are readily accessible for lubrication.

A non-reversible constant speed motor may be used if desired, because the reverse is obtained mechanically, by means of the rod shown mounted above the lathe. This rod is out of the way, yet very convenient to the operator. The superiority of this construction is that the motor is at no time reversed, but runs at continuous constant speed, all starting, stopping and reversing of the machine being readily accomplished without interference with the motor.

The motor is substantially mounted above the all-gear head stock, and the lathe may be at any time converted into a belt-driven machine, by replacing the motor with a single pulley mounted on the upper shaft.



A NEW MOTOR-DRIVEN LATHE.

New Railroad Outlet for Pittsburg.

The Lake Erie & Pittsburg Railroad Co., a new line which is being surveyed to Lake Erie from Pittsburg, is to provide another outlet for the vast traffic from that district. The lake port is to be Lorain, O., where valuable terminal privileges have already been secured on the Black river. The road will be close to 140 miles long and the estimated cost is placed at $16,000,000. At Hudson, O., the road will connect with the Cleveland & Pittsburg branch of the Pennsylvania Railroad, going thence to Youngstown, and from that city to Pittsburg. William Kenefick is president; John B. Carter, vice president; J. C. Duffin, secretary; H. H. Lyon, assistant secretary, and Richard Zenkere, treasurer. The Pittsburg tonnage which has reached such enormous proportions, is being sought after more and more by railroad interests that never before touched Pittsburg territory. Figures of the rail shipments compiled by the various car associations show the handling of more cars in the Pittsburg district than any other in the country. The leading districts and the number of cars are given below:

	June		Six months.	
	1903	1904	1903	1904
St. Louis	53,031	52,019	406,174	350,011
Chicago	159,500	159,208	903,834	862,062
Cincinnati	54,763	49,998	313,400	286,409
Cleveland	46,017	42,941	258,388	259,904
New England	163,258	151,461	919,555	833,933
N. Y. and N. J.	81,036	76,752	469,532	441,855
Philadelphia	173,451	142,802	937,550	799,348
Pittsburg	245,433	188,253	1,271,208	1,071,868

While Chicago has an outlet by no less than 24 separate railroads; St. Louis, 18; New York, 13; Cincinnati, 16; Cleveland, 8; Pittsburg has only 9, counting the Pittsburg & Western and the Baltimore & Ohio separately, although controlled by the same interests, and including the West Side Belt, only a short line, Pittsburg, Chartiers & Youghiogheny and the Castle Shannon, which are feeders and not outlets for the great tonnage of the territory.

The annual meeting of the American Society of Mechanical Engineers will be held in New York commencing on Tuesday, Dec. 6. The spring meeting of 1905 will probably take place in Scranton, Pa. The recent convention in Chicago was a meeting of the American Society and the British Institution of Mechanical Engineers. The joint participation in the discussions by Americans and Britons has made it necessary that the text of these discourses should be sent to England and revised there, before the papers of the Chicago meeting can be made ready for distribution. This condition will compel an unusual delay in the distribution of the revised papers of the Chicago meeting, with discussion.

The Filer & Stowell Co., Milwaukee, has brought suit to enjoin the city of Milwaukee from carying out the contract with the William Tod Co., of Youngstown, O., for a new 20,000,000-gallon hign pressure pump for the Milwaukee Water Works. The ground for the suit is that the clause requiring that the work be done under the eight-hour rule is unconstitutional.

Conduit System of Handling Blast Furnace Stock.

The storage and handling of stock at blast furnace plants has led to the development and installation of expensive bin systems in connection with elaborate machinery for the delivery of materials at the furnace top at a minimum outlay

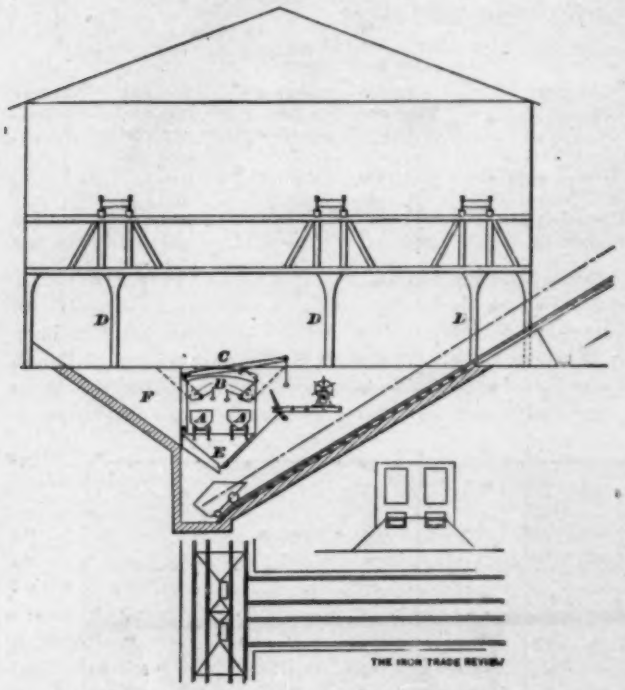


FIG. 1.—SECTION OF TUNNEL AND OF TRESTLE AND STORAGE BINS. ALSO PLAN AND SIDE ELEVATION OF TUNNEL.

for labor. Notably at Northern furnace plants the overhead bin system is in pretty general use, while at a number of plants in the South a less expensive and simpler system has been devised and is in use, the reduction in labor costs being greater than where the overhead system is operated. In the latter system steel or wooden bins are used for the storage of the ore, limestone and other materials, these structures being exceedingly costly on account of the great weight they are to support, including not only the furnace materials, but tracks, trains of cars and locomotives. The foundations for such a structure are built at heavy cost, this often being as great as the entire cost of the installation of the other method.

By the latter method the ground serves as the bin into which the ore, limestone and other materials are dumped, with a tunnel running underneath provided with chutes through which this material flows into transfer cars for conveyance to the furnace skips. In the case of the overhead system the bottoms of the bins are some distance above the ground and they are provided with chutes for discharging the ore into cars traveling on tracks underneath the chutes. These bins are expensive, as the bottoms must be high enough above the ground to permit of the cars clearing the gates through which the material drops into them. The bottoms in addition must be very strong to support the great weight of the ore and limestone stored.

In many expensive plants the trestles on which the elevated tracks are carried have not been built with a view to the use of such bins, and hence their introduction is not practicable, because the necessary height of the bottom of the bin above the ground to permit the use of the cars in the manner above mentioned would materially decrease the storage capacity, thus perhaps more than counterbalancing the economy derived from the modern bin structure. In order to secure the proper height and maintain a sufficient storage capacity it would not only increase the grade to an impracticable extent, but it would be very expensive to raise the trestles and would entail in many cases such a radical change in railroad yards and in the disposition of the tracks as to make the bin system impracticable, not only on account of the larger expense of reconstruction and rearrangement, but because of the additional expense of elevating the roof of the old stockhouse. This system was designed with a view to providing blast furnace plants, particularly those in which the abovementioned conditions exist, with a storage structure having the advantages of the bin system, but at a reduced cost of installation and maintenance. At one Southern furnace plant, where two stacks were operated, this system did away with 70 stockhouse fillers per furnace, and insured the continuous operation of the furnaces which before was impossible with the employment of a large number of negroes in the stockhouse.

The accompanying illustrations give an excellent idea of the method of storing and handling ore by this system. The bottom of the tunnel shown in Fig. 1 is sufficiently below the level of the ground on which the ore is stocked to allow the cars A, running in the tunnel, to pass under various chutes B, which project from different points along the tunnel, discharging material into the cars. The ground serves as the floor, or the support for the floor, in the bin structure, thereby avoiding the expense of raised bin bottoms. The conduit is covered by a roof C, sloping towards each side,

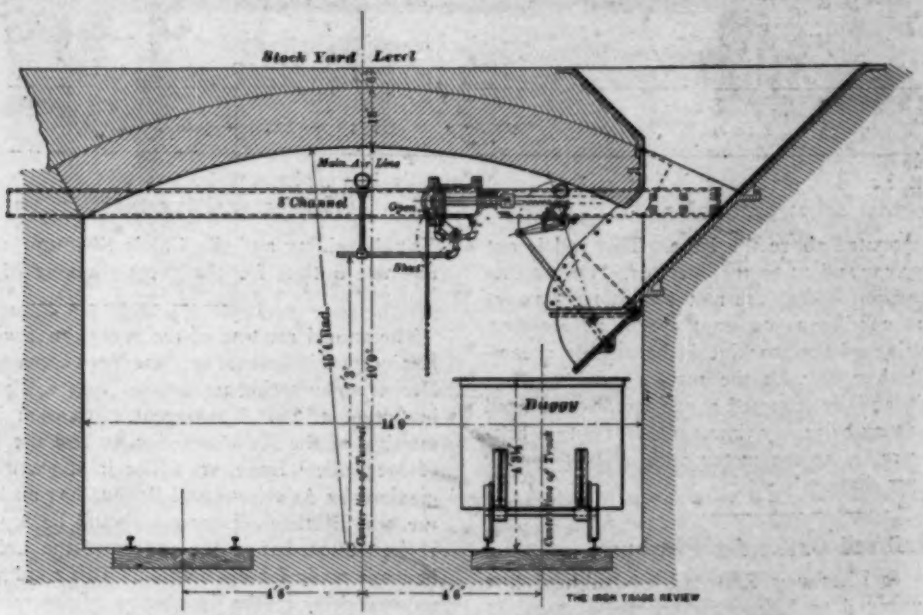


FIG. 2.—SECTION OF TUNNEL SHOWING ARRANGEMENT OF ORE SPOUTS.

so that the material which is stored over the tunnel roof will slide towards the chutes. On each side of the tunnel is a trestle supporting tracks on which run the cars for carrying material for delivery to the storage bins. The space underneath the trestle may be divided into bins by means of partition walls D, preferably secured to the trestles. Charges are dumped, after being made up and properly weighed, by the

operator in charge of the transfer car A into a pocket E. This pocket is equipped with a door by means of which the skip operator permits the ore to drop into the skip. This pocket arrangement has proved a great labor-saving device, as the transfer car operator can dump his entire charge without being compelled to wait until the skip is in place to receive the same. This enables the transfer car operator to dump his charges as fast as they can be made up and weighed and the loss of time occasioned by being compelled to wait for the skip to be in position to receive the charge is entirely obviated. The number of cars an operator can handle in a day by the use of this pocket is therefore greatly increased. The coke bin is indicated by F, and it is equipped with another door by means of which the coke is dropped into the skip by the same operator who also runs the motor for hoisting the skips, operates both bells at the top of the furnace, and tests the furnace to see how low the stock is. In addition to these duties he attends to the weighing of the material, the scales being close to him and the lever in plain sight. Directly back of the operator is the tunnel, and without moving from his position he can see that the ore for the charges is brought in the proper rotation. Fig. 4 shows the operator in position to look after these numerous duties. Fig. 3 shows another application of this system in a sectional view. By this arrangement four trestles are used, the conduit for the transfer cars being endless and oval in plan, the cars running up between two trestles and returning between the other two. This arrangement also shows a modification of the coke bin system, this company having coke from its own ovens which is dumped into bin No. 1 while purchased coke is dumped into bin No. 2. Coke from No. 1 bin flows over the tunnel down through an opening which is boxed at the back and on the two sides, to two spouts located near the center line of the two skips, one spout discharging into each skip. Coke from bin No. 2 flows down on the outside of this box and discharges through two other doors further from the center line of the skips, one door also discharging into either skip. By this method the skip operator can fill any proportion of either kind of coke into either skip.

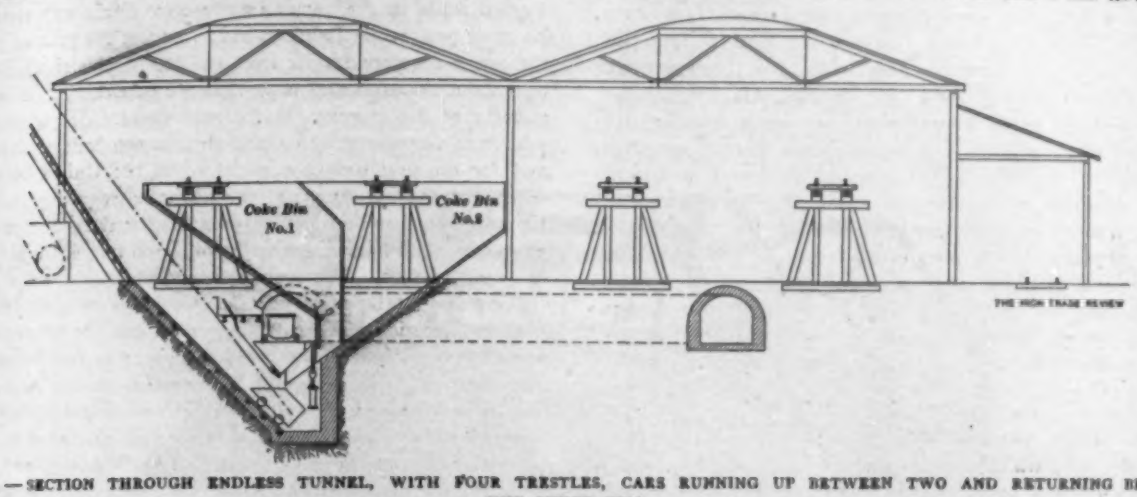


FIG. 3.—SECTION THROUGH ENDLESS TUNNEL, WITH FOUR TRESTLES, CARS RUNNING UP BETWEEN TWO AND RETURNING BETWEEN THE OTHER TWO.

Fig. 5 is a section through the tunnel and chute, the chutes entering in on either side of the tunnel, the spouts on either side of the tunnel being placed so that they do not come opposite one another. The spouts can be operated by compressed air or the system can be modified to work by electricity or hand. The transfer cars can be operated by electricity or rope haulage, and at a comparatively small furnace the cars can be pushed by hand, giving a slight fall towards the ponit of discharge and having the wheels of the cars equipped with

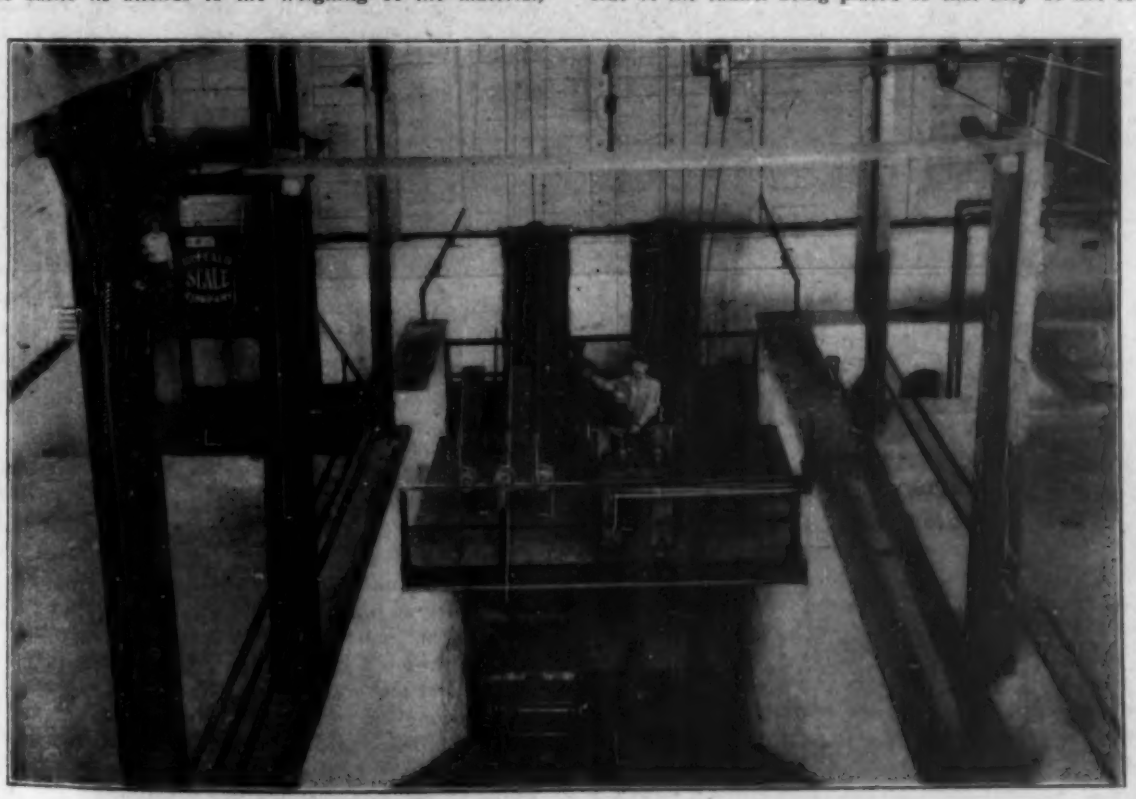


FIG. 4.—SKIP OPERATOR IN CHARGE OF SKIPS, FURNACE BELLS, COKE SPOUTS, SCALES, ORE SPOUTS INTO SKIPS AND APPARATUS FOR TESTING STOCK LEVEL IN FURNACE.

roller bearings. At some plants the transfer cars are run in trains of six, operated by one man, while at smaller plants the transfer cars are operated singly.

This system, on which patents were secured by A. H. Woodward, has been developed by Walter Kennedy, mechanical engineer, Pittsburg, and up to the present time installations have been made at the following plants: Woodward Iron Co., Woodward, Ala., three furnaces; one furnace, Low Moor, Va.; one furnace, Alabama Consolidated Coal & Iron Co., Gadsden, Ala.; one furnace, Tuscaloosa, Ala.; two furnaces of the Republic Iron & Steel Co., Thomas, Ala.

A number of similar installations are being considered at Northern furnace plants. It would seem that an important advantage of the tunnel system would be found in districts where difficulty is experienced from the freezing of ore carried in stock in large quantities through the winter. The outside portions of ore piles often freeze to a depth of two or three feet, forming an impervious crust. With a tunnel located under the center of a large pile of ore, all the ore except the outside frozen crust can be handled as well in winter as at any other time.

E. R. Miller, secretary of the W. E. Caldwell Co., of Louisville, Ky., which manufactures water tanks and towers for many lines of industry, comments as follows on the business situation: "While it is probable that general business in our line has not been so prosperous during the last six or eight months, our own has increased somewhat, and right along our new orders have been a little more numerous than those of last year, which was the most prosperous we had in a quarter of a century. We feel that we have had more than our share, although naturally very little of it has been in connection with the building of new plants. One aspect of the general reaching after economy has been decidedly beneficial to us. Many manufacturers have found, upon inquiry, that they could reduce the cost of their insurance by using an independent water supply in connection with their sprinkler systems, and these have come to us for their tank and tower outfits. Our business has naturally been especially good in the South, which has not yet felt the pinch of business curtailment. Still we are very much gratified that in all sections we have at least held our own, and in many have done better than in our banner year."

General Superintendent J. B. McKennan, of the Colorado Fuel & Iron Co., has posted conspicuously about the works notices stating that the practice of taking liquor into the works or drinking liquor inside of the enclosure must stop immediately. The notice states that any person found guilty of this practice will be discharged. It has developed that some of the foreigners have been in the habit of carrying liquor in their dinner pails and that several fights have been caused by the use of intoxicants inside the plant.

BRITISH REVIEW OF WORLD'S IRON TRADE.

The British Board of Trade, reporting on the world's iron trade in the past year, has a good deal to say of the changes in the period. Its views on some important points are thus summed up:

"The position of the different countries in regard to the foreign trade in ore varies immensely. Spain exports nearly all its output, while Belgium has to import the greater part of the ore it requires for its iron and steel industries. We import about 1,000,000 tons more than we export. The chief contributor to the increase in the manufacture of pig iron last year was Germany, which added 1,500,000 tons to its yield, and for the first time got ahead of of the United Kingdom, where, as also in America, the advance was very little. In Canada there has been steady progress for the past five or six years, the yield having grown from 68,800 tons in 1898 to 319,600 tons in 1902. The memorandum adds:

"Government bounties on the production of pig iron have been in operation in Canada since 1897, and are to continue in force, though subject to a gradual reduction, until 1907; but although the bounty is on a higher scale in the case of pig iron made from native ores, the pig iron produced in Canada from Canadian ore is much less than that produced from imported ores, and the greater part of the Candian ore is exported. The extent to which pig iron enters into foreign trade is small in proportion to the quantity produced. The exports of pig iron from the United Kingdom are greater than the total exports of all the other countries included in the tables. Nevertheless, on an average of the three years 1900 to 1902, they only amounted to 1,123,000 tons, or 13 percent of the average production of those years. The United States in 1902, and again in 1903, imported more pig iron than she exported, though in most recent years the reverse had been the case. On the other hand, France and Germany, which in the last few years had been importing countries, exported more than they imported in both 1902 and 1903.

"The greater part of the pig iron is used in the manufacture of steel, the output of which has greatly increased in late years. The yield of the United Kingdom in 1903 amounted for the first time to over 5,000,000 tons. No figures are available showing the exact quantities of pig iron which are thus converted, but a comparison of the total quantity of steel produced with the total quantity of pig iron consumed for all purposes indicates that in both the United States and Germany a larger proportion of the pig consumed is converted into steel than in the United Kingdom.

"Thus, for every 100 tons of pig iron consumed for all purposes Great Britain produced on an average of the three years 1900-02 about 64 tons of steel, while Germany produced 79 tons and the United States 81 tons. In France the quantity of steel produced per 100 tons of pig consumed was about 60 tons, and in Belgium about the same as in the United Kingdom. Several new tables showing the iron and steel exports, and imports of the principal countries have been added to this issue of the return, and both complete its usefulness and enlarge its interest."

FIG. 5.—INTERIOR OF TUNNEL SHOWING ORE DISCHARGE SPOUTS.

THE PASSING OF THE BOOTBLACK.

The advent of machinery into any business where repetition is the main requirement is only to be expected. Shining shoes is a case in point and quite recently machines built for this purpose have been installed in Cleveland, Chicago, New York, St. Louis and other cities. The two types of machines now in operation are illustrated; the larger one is run by a 2-h. p. electric motor and requires a space about 12 feet square. The mechanism is entirely automatic in operation and works with clock-like regularity. The larger machine, Fig. 1, has a rotating platform mounted on an antique oak or mahogany base. This is surrounded with a brass railing which protects the customers and gives the outfit a neat finish. The patron climbs the steps at the extreme right and is seated upon the stool nearest to that point. The rotating platform has an intermittent motion with intervals when the table remains still for 20 seconds. This allows time for stepping to the seat which has just been vacated and the platform then makes one-sixth of a turn. The machine runs continuously, and as fast as one person gets off another may step on. As the seats are successively brought in front of the sets of rotating brushes these take up the task in turn. These brushes are arranged in sets of three with long flexible bristles and effectively reach the sides and top of the shoes at a single stroke. The speed of stroke and number of turns per minute of the brushes have been given close attention in the first machines and the latest type performs the various operations very successfully. The brushes are mounted on shafts with universal couplings and are pressed together and toward the work by quite flexible springs with a wide range of action. By this means the machine easily handles shoes of all sizes and sorts.

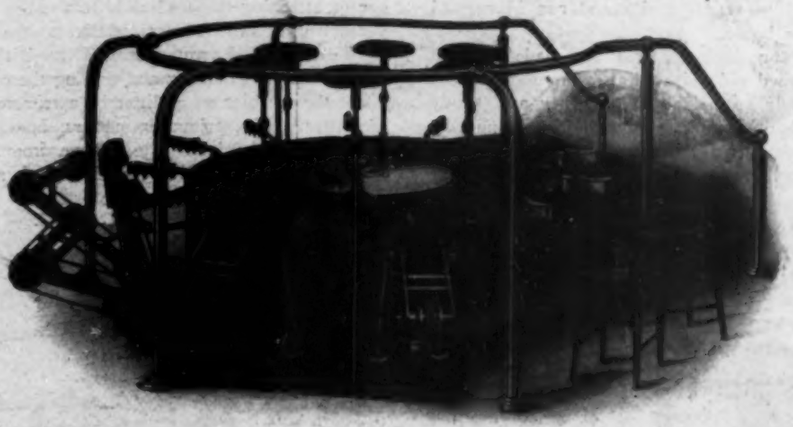


FIG. 1.—SHINING SHOES BY ELECTRICITY.

There are six stools on the machine and it is evident that during the one rotation of the machine a number of persnos may have their shoes cleaned by machinery. The time allowed for a complete rotation of the machine is two minutes.

The individual machine, Fig. 2, is employed for a single pair of shoes and will perform the necessary operations in from 1½ to 2 minutes. The stand is 18 inches high, 40 inches wide and 70 inches long. The lever, seen attached to the shaft or stem supporting the stool, is employed for the purpose of bringing the shoes around in position for the action of the brushes.

The shoe polishing machine of the largest size, Fig. 1, requires quite a little assistance when running full or when the patronage is heavy. The blacking is applied by hand and when the table moves from one station to another, it moves far enough to have the man operate on two shoes during the intermittent dwell in the movement of the mechanism. The latest machine is now under construction and is in several particulars an improvement over the others. In the new machine only one shoe is blackened at a time and the table moves but half the distance. Each shoe then goes through every operation as follows: The first operation is performed by a brush equipment with stiff bristles to clean the shoe free from dirt. Then follows another set running at a low rate of speed for spreading liquid polish on the leather and the next stage in the progress of the machine is at an empty or brushless station where the liquid has a chance to dry. A boy is waiting—and not waiting long—at the next location of the shoe and he puts on a small amount of paste by hand, then the shoe passes successively through four other stages where the electricity driven brushes shine and buff the leather surface to a finish.

The machine does all the work automatically, carries the patron from point to point, the platform turning smoothly and locking at each stage in properly indexed fashion, the brushes come into action at the right instant and rotate and adjust themselves to any footwear. With but the one station where the boy puts on the blacking, the machine does everything and keeps at it. One of the machines on exhibition and in service has a vertical shaft extending up from the center of the platform and this shaft has at the top a series of fan blades which send down a current of cool air upon the patrons seated beneath.

These machines are manufactured by the Electric Automatic Mfg. Co., of Chicago.

The stockholders of the American Steel Package Co., Defiance, O., have elected the following directors: Curtis M. Willock, Harry Willock, S. M. Willock, A. T. Kruse and Christ Diehl Jr. The stock, real estate, etc., have been transferred from the old corporation to the new. While the control of this concern has passed from Defiance to Pittsburg parties, the latter have bound themselves not to move the plant to Pittsburg or elsewhere within ten years, and not then unless by the consent of 75 percent of the stockholders. Curtis M. Willock will assume active management.

FIG. 2.—ANOTHER TYPE OF SHOE POLISHING MACHINE.

H. W. Buttorff and other citizens of Nashville, Tenn., have purchased the Indiana Mfg. Co., and the Indiana Chain Co., both of Indianapolis, Ind. The capital stock of the first named company will be increased to $75,000 and that of the latter to $50,000.

SLITTING, HEADING AND CRIMPING MACHINES.

The Utica Industrial Co., of Utica, N. Y., manufactures a line of slitting, heading and crimping machinery. Fig. 1 is the rotary tin slitter. The side frames are made heavy and massive and form the supports of the entire machine, tied on the front by the table, on the top directly over the cutter shafts by a heavy angle bar, and midway, directly under the cutter shafts by a box section tie bar for maximum strength and rigidity. The cutter shafts are made of crucible steel, are large in diameter and accurately ground. They rotate in reamed and scraped cast iron boxes in accurate and permanent alignment. The feed rolls are made of unannealed tool steel and are ground to standard size and run in reamed and scraped cast iron boxes.

The rotary shears or slitting knives are made of high grade tool steel, hardened and tempered after the most modern methods, and accurately ground all over. They are strictly interchangeable and both edges can be used for cutting purposes. The cutter hubs are cast iron with accurately ground bores which fit perfectly on the ground cutter shafts. The method of mounting the cutters on the hubs and securing the hubs on the cutter shafts is original and efficient.

The machine is provided with both automatic and foot feed. The arrangement of the automatic feed is designed to give

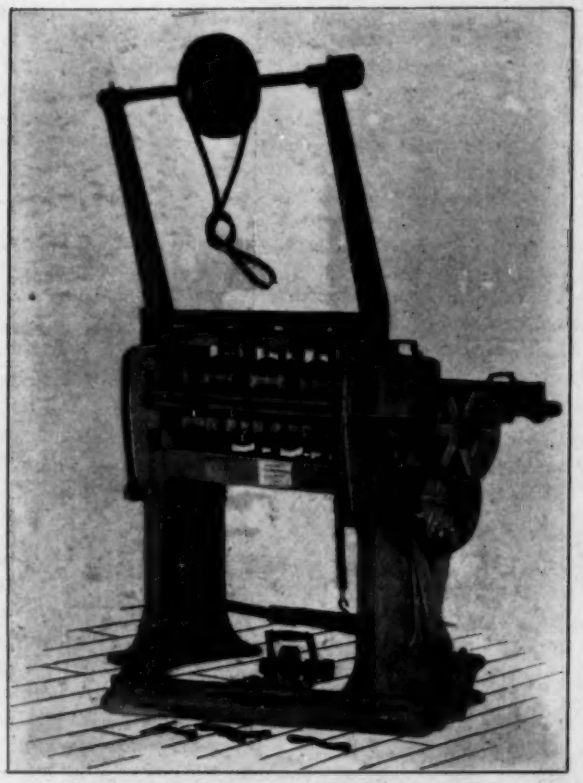


FIG. 1.—A SLITTER WITH GRINDING ATTACHMENT.

the utmost flexibility to this operation. The feed slide is driven by a large friction washer, the tension on which is capable of the most delicate setting, so that the automatic feed can be made as powerful as desired, or, by proper adjustment and slight manual retardation, converted into a delinquent automatic feed, thus placing within the power of the operator means of automatically feeding the machine at any desired speed without in any way altering the regular speed of the machine. The delinquent feed is produced entirely by the retarding action of the operator's left hand, in holding the feed slide against the action of the friction drive.

The change from automatic to foot feed is accomplished without adding to or taking away any part of the original machine, except a small stud and cam roller. A notable feature of the automatic feed lies in the method of control. A horizontal treadle shaft is mounted in the machine and one end extends beyond the left housing, carrying loosely a rock lever and a securely mounted trip lever. A friction gear rotates continuously by direct connection to the main driving sleeve. A friction cam, mounted on the same stud with the rotating gear, is held by a stop pin engaging the end of the trip lever. On depressing the treadle the trip lever swings out of contact with the stop pin and the friction cam is instantly carried rotatively at the same speed as the driving friction gear, and will continue to rotate as long as the treadle is depressed. Upon releasing the treadle the trip lever assumes its normal position along the path of the stop pin and engages at the out-stroke point of the feed slide, thus holding the feeding mechanism at rest until the treadle is again depressed. This operation can be repeated indefinitely and gives complete government of the automatic feed.

Mounting the feed slide on the side of the machine permits a bed with a perfectly smooth and unbroken surface. The manner of attaching the feed slide to the bed maintains absolute parallelism of the feed arm relative to the feed rolls.

The design and arrangement of the driving mechanism and the manner of mounting and driving the cutter shafts readily adapt the machine as a slitter or a trimmer. The extra pair of cutter shafts, trimming cutters, boxes and cutter shaft gears, allow the immediate change from one to the other. The position of the driving mechanism is such that the cutter

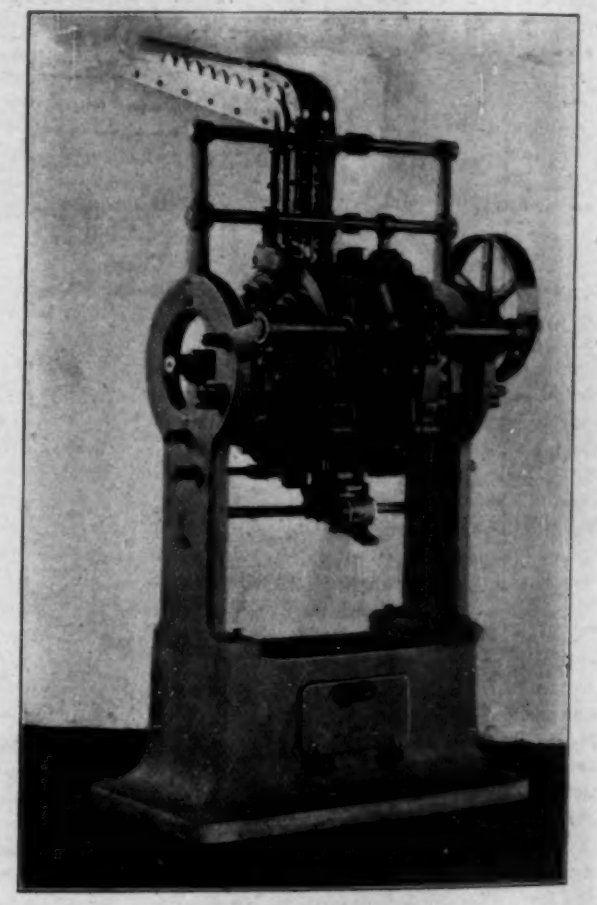


FIG. 2.—CAN HEADING MACHINE.

shafts can be removed and others placed in the machine without disarranging any of the parts or removing the driving belt.

A specially constructed grinding attachment is furnished with each machine. This is shown on the floor at the base of the machine in Fig. 1. The grinder frame is readily attached in place between the housings of the slitter. The grinder, its method of operation, and arrangement of parts are adapted to grind the sides of the cutters only, the diameters remaining constant. By this method the proportional speeds of the cutters and feed rolls never vary, thereby tending toward better results. The grinder is driven from the belt shown on the upper cross shaft of the slitter.

The grinding attachment, the cutters and cutter hubs are interchangeable on all machines. Any of the slitters can be equipped with electric grinder for sharpening the cutters and when so equipped the countershaft and supports mounted on the top of the slitter are removed, the lower rail and brackets remaining the same as with the regular grinding attachment.

The slitter illustrated is 34 inches between the housings and permits the cutting of plates 32 inches wide into strips of any desired width of not less than 2 inches. The firm is also making a similar machine for those not handling such large plates. The latter machine is 26 inches inside the housings.

The can header seen in Fig. 2 is entirely automatic and is built after improved designs. What has already been said of the workmanship and material of the slitter equally applies to the header and crimper. The general arrangement of the heading mechanism comprises sets of opposed sizing jaws and heading plungers. The opposing jaws of each pair are mounted in permanent alignment and are positive and simultaneous in operation; the easy action causes the machine to be free running and noiseless.

A feeding chute is provided and this has novel features rendering practicable the successful handling of difficult material. For example, can ends made of taggers tin, a light and springy material, are readily manipulated by the machine. The means of attaching the chute to the machine and its operating position relative to the heading mechanism give a decided advantage in operation. The heading mechanism is given a continuously rotative motion. Each set or pair of heading jaws in passing the chute is automatically supplied with a can body and ends, each being placed in precisely the requisite position in the jaws. In the continued rotation, each of a pair of sizing jaws is operated upon by cams arranged in the rotative path. These close the jaws over the can body and ends and hold them in perfect axial alignment during the time the heading plungers are placing the ends on the body. After passing this point the sizing jaws are again actuated by cams and replaced in their normal inactive

FIG. 3.—A ROTARY CRIMPING MACHINE.

position, the headed can during this period being held from any movement relative to the jaws by means of yielding mechanism acting on the plungers. By continued rotation the headed can is retained between the jaws until the ejecting chute is reached and at this stage the can is positively discharged from the machine. The sequence of operations being continuous and automatic gives the machine a large output. The machine as at present constructed is provided with eight pairs of heading jaws and these ensure a capacity of 150 cans per minute.

Machines are now in use on cans for condensed milk; the cans have taggers tin for the bottoms and the work is being done with excellent results. The machines are built for any size and length of can, from the smallest one pound up to the largest three pound. The jaws are not adjustable to different diameters but are adjustable to different lengths of the same diameter, each changing diameter requiring an extra set of sizing and heading jaws. Under this method of construction the sizing and heading jaws are a fixed quantity and it absolutely eliminates all annoying delays incident to the continual tampering with a machine in the direction of proper adjustment and good working order. The machine once set is then permanent so far as the diameter of that especial can is concerned. A notable feature of the driving mechanism lies in the fact that it can be located on either side of the machine, and is at pleasure right or left hand to suit the position of the shafting, etc.

In connection with the heading machine the company manufactures a rotary crimper, Fig. 3, of ample capacity. This machine is adjustable for round cans from 2½ up to 4½ inches in diameter. The adjustable feature of this machine is a novel departure and the change can be made in a very few seconds. The firm is also making lock seam body machines and automatic can testers for use in connection with the machines here described. These will operate at about 100 cans per minute.

COAL AND TIMBER EXPERIMENTS AT ST. LOUIS.

In the Mining Gulch at the world's Fair in St. Louis there are now being completed two exhibits which have more than temporary interest and value. They are the coal testing plant of the United States Geological Survey and the timber preserving plant of the Bureau of Forestry. The Mining Gulch lies between the Palace of Mines and Metallurgy and the Inside Inn. Its entrance is diagonally opposite the southeast corner of the Mines and Metallurgy building. The Government coal testing and timber preserving plants stand along the railroad tracks which run up the gulch and are near the entrance. Each plant depends for its operation largely upon Allis-Chalmers Co.'s machinery, loaned without pay by the company. The work of the coal testing plant will be the determination of the respective fuel values of every grade of coal which may be submitted. A 250-h. p. horizontal Allis-Chalmers engine in this plant supplies power for the various mechanical operations to which the samples of coal will be subjected, and also serves to give practical tests through its power-producing qualities of the actual values of the various coals. The samples of coal will be analyzed, burnt under boilers under varied conditions, coked and used for gas producing. Their values for gas production and the power qualities of the gases will be tested in a gas engine. Records of every test will be kept and it is believed data will be secured which may result in the early development of several new coal fields in the country.

The timber preserving plant, which stands about a hundred yards further up the gulch than the coal testing plant, is under the direction of Dr. H. Van Schrenk, of the Shaw Gardens, St. Louis. Its special work will be to test all the various methods offered for preserving railroad ties. For this purpose the Allis-Chalmers Co. has lent a tie-treating retort and two tanks for the preservative solutions. Practically all the methods which are now in use for preserving railroad ties and other timber from rotting when exposed to earth and weather are alike in the treatment and differ only in the preservatives employed. The system supplied by the Allis-Chalmers retorts and tanks consists in placing the ties in the retort where the first operation is to dry out all of the water and sap by heat and exhaust all of this and the greater part of the air from the retort proper pumps. Then while the pores of the wood are all open and practically free from vapor, moisture or air, the preservative mixture is let into the retort from the tanks. The preservatives are thus, under the influence of the vacuum in the pores of the wood, carried into every part of the ties or timbers, no matter how thick or long they may be. The great need of finding some process for making timber for railroad ties last in the ground beyond its natural life comes from the practical exhaustion of the supplies of such good timbers as white oak for this use. Railroads must now use timber of such kinds as they can get for ties and much of this is of a very inferior quality. In order to protect these poorer classes of ties from early decay many methods of preservative treatment have been devised and almost every one has shown good results under certain conditions. At the plant now established at St. Louis it is intended to treat various lots of ties by various processes. Each batch of ties will then be put into regular service in some railroad track and a record kept of each tie until it is worn out or rotted out.

According to J. J. Langer, consul at Solingen, Germany, the exports of machinery from Germany increased notably during the first three months of 1904, amounting to $14,518,000, against $11,424,000 in 1903 and $10,234,000 in 1902. The countries to which the export has most decidedly increased are Russia, Austria-Hungary, France, Switzerland, Spain, Holland and India.

TRADE PUBLICATIONS.

A beautifully illustrated catalogue from the Gleason Works, at Rochester, N. Y., is bound in an embossed cover, tied with light blue ribbon and sealed with wax bearing the impression of a specially designed die. The ribbon bears the words "Quiet Power" and the whole arrangement of text, illustrations and binding suggest and strengthen the hint contained in the phrase. The Gleason Works produce gear planers, capacity from 12 inches up to 30 feet diameter, and also manufacture gears from one inch up to 18 feet diameter. The pamphlet de luxe starts out with a description of the new type of bevel gear planer, capable of cutting bevel and mitre gears up to a diameter of 15 inches. A peculiarity of this machine is that it removes the metal with a shearing cut, the tool rolling as it advances into the work. The motion of feeding a tool into the work, following a path conforming to the contour of the tooth, is obtained by rolling and advancing the arm on which the tool carriage reciprocates. Following the description of this machine comes a recital of the features of other gear planers and these also are shown with line drawings exhibiting the action and advantages of the different types. There are many admirable halftones, each on toned paper and on individual pages with all the possible prominence of wide margins around clear cut prints.

"What We Do" is the title of the briefest conceivable enumeration of the business purposes of the Wellman-Seaver-Morgan Co., of Cleveland. There are many thumbnail pen and photographic pictures of plants and products, but detailed information and more extensive illustrations of the varied lines must be sought in the larger classified and general catalogues of the firm. The little pamphlet outlines by the shortest route the firm's equipment, engineering and manufacturing, for the removal of ore from the mine to turning it into completed product, as well as for other complicated and responsible undertakings. This work is inclusive of consulting engineering in all its phases, manufacturing work, comprising buildings, steel works machinery, ore and coal handling machinery, excavating and conveying machinery, coke oven machinery, power machinery, mining equipment, hoisting engines, railway specialties, gun carriages, steel and iron castings, etc.

A booklet has been published by Bruce & Johnston, of New York, for the Engineering Co. of America. It is a preliminary treatise on concrete designed to stimulate still greater interest in this form of building material. The diagram curves showing the immense increase in the use and production of cement in the United States for a dozen years are startling in the story told of progress. An examination of the diagram given in the pamphlet ascertains that in 1890 the domestic production of Portland cement was well below a half million barrels and at that time the importations amounted to four times that quantity. The importation of Portland cement increased rapidly in 1891, decreased the following year and then rose gradually to over three million barrels in 1895. From this high-water mark it fell to two millions in 1898, being passed in 1896-7 by the ascending line of domestic production at 2,400,000 barrels. Imports sank to less than a million barrels in 1901 and rose to double this amount in 1902 but meantime the domestic production had soared to 17,250,000 barrels in the latter year. The pamphlet submits other noteworthy data pertaining to this plastic and durable material in simple and reinforced forms.

The Louisiana Purchase exhibit of the Becker-Brainard Milling Machine Co., of Hyde Park, Mass., is located in Block 13, Machinery Hall. It consists of machines selected to represent, as far as the limited space will permit, the principal lines of tools manufactured by the firm. These machines are illustrated in the booklet with small but very good halftones and a few particulars, a sentence or two, in each case. The details can of course be obtained from the complete catalogue sent out by this the largest works in the world exclusively devoted to the manufacture of milling machines. The plant at Hyde Park has been recently entirely remodeled and equipped with improved tools.

The Rust water tube boiler was fully described in *The Iron Trade Review* of July 15 and the account with some further facts may be found in a catalogue now to hand. The boiler in question was first introduced at the Minnequa Steel Works, of the Colorado Fuel & Iron Co., at Pueblo, Col., and was designed and patented by the former chief engineer and general superintendent of that plant, E. G. Rust. He is now associated with the Rust Boiler Co., of Pittsburg.

Shaper argument is plainly put in the publication received from Gould & Eberhardt, of Newark, N. J. The latest contribution to the trade literature of shapers and attachments is catalogue "B" and shows at a glance the progress made from 1875 to 1904. The pamphlet not only carries an excellent supply of information in the way of pointed descriptive text and illustrations but has been arranged with due regard to the lessening of sales friction between reader and manufacturer. For purposes of comparison much detail is in the average catalogue parceled out into lots but there is not always a ready connection between this material and the illustrations as well as the grouped attachments, etc. Below every engraving of a machine in the present instance is the code word, the size and a reference to the exact page where the detailed dimensions, the illustrated attachments and the electric motor drive may be found. The halftones are frequently located with some additional data but the illustrations are given liberal space on the page and the path of the busy reader marked carefully to the information he may be expected to desire in advance of formal inquiry. A number of attachments, vises of varied forms, concaving as well as convexing devices, spiral cutting rigs, etc., are shown and there are interesting particulars of motor drives, shapers as manufacturing tools, useful wrinkles in shaper service, etc.

The Vulcan Iron Works Co., of Toledo, O., has a 1904 electoral chart. This gives the result of the vote four years ago by States and in addition to the figures there is a map showing in colors the political hold of the contending parties in the last election. A very little space on the sheet is given up to the dredges, shovels, boiler fronts, and fittings made by the company at Toledo, but this limited amount calls attention in general terms to the thirty-years experience put into steam shovel product.

Some representative installations of DeLaval steam turbines and electrically driven centrifugal pumps are presented in Bulletin No. 7, of series "T," of the D'Olier Engineering Co., of Philadelphia. One of these views is from the Maryland Steel Co.'s plant at Sparrows Point, Md. A complete line of turbine driven generators is also made at the DeLaval shops. These can be furnished in sizes up to 200 kilowatts, for either direct or alternating currents, and in the usual voltages, frequency and phase commercially employed.

Pamphlets on power punching presses and sprue cutters, and straight sided power presses, are from the E. W. Bliss Co., of Brooklyn, N. Y., and these are accompanied by a catalogue in Spanish treating of the machinery for bending, slitting, pressing and otherwise working sheet stock as in can factories, etc. A neat note book for the vest pocket has press particulars interleaved with information about the strength of materials, weight of bar and sheet stock, etc.

The Stiles-Morse Co., of Chicago, has some circulars and a pamphlet on filing machines, power presses, gears and pinions, etc. Many of the engravings are located along with more or less useful tables and the combination cemented together by catch phases such as: "The most profitable time to set a hen is—when the hen is ready. When you get ready we'd like to 'set' a time and place to talk business."

That the B. F. Sturtevant Co., which has recently moved from Boston to its new office and works at Hyde Park, Mass., will press the sale of economizers is evidenced by the new economizer catalogue. This catalogue contains the details of the Sturtevant "Standard" and "Pony" types of economizers in comparison with those of other makes, the advantages, sizes, weights, accessibility, repairing, etc. It also treats of the subject of mechanical draft and natural draft and is of interest to steam users. It may be obtained by any one interested in the subject.

The third open-hearth furnace of the Harrisburg Pipe & Pipe Bending Co. has been completed and will be making steel by Aug. 22. The company has had two open-hearth furnaces in constant use since the plant first made steel some months ago.

IRON ORE PRODUCTION IN 1903.

The United States Geological Survey has just published the statistics of iron ore production in the United States in 1903 as prepared by John Birkinbine, of Philadelphia. The report shows that the iron ore production in this country last year was 35,019,308 long tons. This is a decrease of 534,827 long tons, or about 1½ percent, from the maximum of 35,554,135 long tons in 1902. The quantity mined in 1903 is, however, the second largest recorded, and is greater than the combined totals for the year 1902 of Germany and Luxemburg, and the British Empire, which are the nearest competitors of the United States. The data for 1903 for these countries are not yet available, but the same comparison will probably prove true for this year also. The average of the annual production of iron ore mined in the United States in the last 15 years, 20,368,088 tons, exceeds the maximum output of any other country in any one year, the maximum production for Germany and Luxemburg being 18,964,294 metric tons in 1900, and for Great Britain 18,031,957 long tons in 1882.

In 1903 the quantity of red hematite mined in the United States was 30,328,654 long tons, or 86.6 percent of the total for the country, a decrease of 203,495 tons, or about 1 percent, from the 1902 production of 30,532,149 long tons. Minnesota contributed over one-half of the red hematite ore, followed in order by Michigan and Alabama, each of these States, with the exception of Michigan, showing an increase over the 1902 totals.

The total quantity of brown hematite mined in 1902 (3,305,484 long tons), decreased in 1903 to 3,080,399 long tons, a loss of 225,085 tons, or 7 percent. Alabama was the most important contributor of this class of ore, followed by Virginia, West Virginia and Tennessee.

The production of magnetite in 1903 was 1,575,422 long tons, a decline of 113,438 long tons, or 7 percent, from the 1902 total of 1,688,860 tons. The three principal States mining this class of ore are New Jersey, New York and Pennsylvania, ranking in 1903 in the order named.

The carbonate ores show an increase, the 1903 total of 34,833 long tons being 7,191 tons, or 26 percent, more than the quantity mined in 1902, 27,642 long tons. As in 1902, all all of this class of ore was obtained in Ohio and Maryland.

The output of concentrated ore in 1903 was 259,469 long tons, most of which was magnetically separated, the remainder having been passed through jigs.

In 1903 there were also produced 73,264 tons of zinc residuum for use in the production of spiegeleisen and ferromanganese.

The iron ore obtained in 1903 came from 22 States and two Territories. Minnesota, Michigan, Alabama and Wisconsin were the leaders in production. Nevada was added this year to the list of producing States, while Vermont and Montana reported no ore mine in 1903. The following table gives the total production of iron ore in each State, with the value of the output at the mine:

State	Quantity (long tons)	Value
Minnesota	15,371,396	$26,833,043
Michigan	10,600,330	25,483,075
Alabama	3,684,960	3,939,600
Tennessee	862,704	1,075,619
Virginia and West Virginia	801,161	1,432,624
Wisconsin	675,053	1,542,517
Pennsylvania	644,599	1,062,455
New York	540,460	1,209,899
New Jersey	484,796	1,330,745
Georgia	443,452	571,124
Nevada, New Mexico, Utah and Wyoming	392,242	612,499
Colorado	252,909	787,824
North Carolina	75,252	99,888
Missouri	62,380	110,127
Texas	34,050	34,050
Kentucky	32,227	46,547
Connecticut and Massachusetts	30,729	82,214
Ohio	29,688	51,956
Maryland	9,920	22,612
Total	35,019,308	$66,328,415

The iron ore mined was of the four general commercial classes: red hematite, brown hematite, magnetite and carbonate. In 1903 the quantity of red hematite mined in the United States was 86.6 percent of the total for the country, and of that Minnesota contributed over one-half. Alabama was the most important contributor of brown hematite. The three principal states that mined magnetite in 1903 were New Jersey, New York and Pennsylvania. The red hematite showed a decrease of about 1 percent from the production of 1902, the brown hematite and the magnetite a decrease each of 7 percent. Only to the carbonate ores, the least important class, showed an increase over the output of 1902. That increase amounted to no less than 26 percent. As in 1902, all of tnis class of ore was obtained in Ohio and Maryland.

The Lake Superior district stands pre-eminent as a producer of iron ore. Its annual output exceeds that of any foreign country, and the average character of its ore is excellent. In the year 1903 the Mesabi and Vermilion ranges in Minnesota, the Marquette range in Michigan, and the Menominee and Gogebic ranges in Michigan and Wisconsin produced a total of 26,573,271 long tons of iron ore. Of this ore the Mesabi range alone produced 51 percent. In addition to the above-named ranges in the United States, a sixth, the Michipicoten range, was opened in Canada in the year 1900, but its product in 1903, 223,976 long tons, is not included in the above data.

Of special interest in connection with the production of Wisconsin is the fact that the year 1903 witnessed the initial output of iron ore in the new Baraboo iron range, near the town of Freedom, in the southern part of the State. These deposits of Bessemer ore, which are within convenient railroad haul of the blast furnaces at Chicago, may furnish important additions to the ore supply of these furnaces.

The State of Pennsylvania showed a decline of 22 percent from the total of 1902. This decline is due almost entirely to the diminished output of one of the large mines, the Cornwall Ore Hills, to which Pennsylvania has been mainly indebted for its position as a prominent producer of iron ores. New Jersey, on the other hand, showed an increase of nearly 10 percent over its 1902 production. The construction of several modern furnaces was the chief cause of the increased output in New Jersey, and it is probable that an augmented production may be expected in the near future.

Iron ore to the amount of 980,440 long tons, valued at $2,261,008, or $2.31 a ton, was imported into this country in 1903 from Cuba, Canada, Spain, Newfoundland, Algeria, the United Kingdom, British Columbia, Belgium and Germany. It is evident from the relatively high value placed on the ores from some countries that the estimate is based on some other constituent than the iron contained in the ore. The total export of iron ore in the year 1903 was 80,611 tons, valued at $255,728. The greater portion of this went to blast furnaces located in the Province of Ontario, Canada.

The Diamond State Steel Co., Wilmington, Del., controlled by Philadelphia capital, was made the defendant Aug. 10 in involuntary bankruptcy proceedings brought by three creditors in the United States Circuit Court, in Wilmington. At the same time this petition was filed a deputy United States marshal conducted a sale in the Philadelphia offices of the company in the Real Estate Trust building, at which he disposed of the office furnishings. This sale was the result of a judgment for $2,532 obtained by the Thomas Iron Co. Officers of the corporation declare the company is not insolvent, and that every cent of indebtedness can and will be paid. Counsel for the company said that the company would not oppose the application for a receiver, but would contest the recent bankruptcy proceedings on the ground that the company is solvent. The court on Aug. 13 appointed Howard T. Wallace, president of the company, and James P. Winchester temporary receivers with authority to continue the business.

The Claire blast furnace of M. A. Hanna & Co. at Sharpsville Pa., resumed operations Aug. 16. The Mabel furnace of this firm, which has been running on flue dust, is about to begin making iron from the ordinary mixture.

No notice for a meeting of the members of the steel rail pool has been issued, but a member of the pool states that a conference will be held in October or late in September, probably at Atlantic City, and the price for 1905 will be announced.

A. Rotter & Co. have purchased the plant of the Silberman Iron Co., at 192 Scranton avenue, Cleveland, and will continue the business in iron and steel scrap carried on by the latter company. The Silberman Iron Co. will be dissolved.

CANADA'S RESOURCES AND POSSIBILITIES.

J. Stephen Jeans, secretary of the British Iron Trade Association, has written and has recently published an octavo volume of 300 pages under the title "Canada's Resources and Possibilities," and the sub-title: "with special reference to the iron and allied industries and the increase of trade with the mother country." Mr. Jeans visited Canada in August, 1903, as a delegate representing the British iron trade at the congress of chambers of commerce of the empire at Montreal. Many of the delegates traveled through nearly 11,000 miles of Canadian territory and visited most of the principal centers of population between the two oceans. It is pointed out in the preface to the book that the Dominion has a special interest for the iron trade of the mother country for the following reasons:

"1. Because it is already the greatest market among the possessions of the British crown after the mother country.

"2. Because it has offered to the mother country greater facilities and consideration than have been offered by any other colony of British possession.

"3. Because the future increase of population, and consequently of iron and steel consumption, in the Dominion is likely to exceed greatly that of any other British possession.

"4. Because Canada herself has enormous resources in the raw materials of the iron industry, and is likely in the near future to enter on a large scale into the competition of iron making countries for the supply of the world's markets.

"5. Because it is the attitude and the conditions of the Dominion that have primarily raised the pending controversy as to the fiscal position of Great Britain in relation to her colonies."

Emphasis is put upon the fact that in the last twenty years the proportion of the total iron and steel imports of Canada contributed by the mother country has fallen from more than 70 percent to less than 25 percent. It is pointed out that in the United States the greatest increase of population and wealth has coincided with the greatest increase in consumption of iron and steel, and it is believed a similar relation between the two may be demonstrated to exist in Canada. The author calls attention to the enormous wheat growing area in Canada, which offers good ground for the expectation that the Canadian crop, now about 96,000,000 bushels a year, may be multiplied several times in the not distant future. In his treatment of industrial conditions in all lines in Canada, Mr. Jeans makes prominent the fact that Canada is ripe for rapid development.

With much more thoroughness than would be expected where materials were gathered on such a trip as the author took, the book enters into the questions that lie at the foundation of Canada's recent progress and indicate the lines of future development. Canadians are regarded as now in measurable distance of being ready to supply the mother country with the great bulk of her foodstuffs. Naturally the author pays much attention to the iron industry of Canada, and the advance made in recent years. The iron ore resources of the Dominion are enumerated, and we find that the same indefiniteness of statement that appears in all efforts to give an idea of the foundations of the future steel industry of the Dominion. The principal deposits of ore thus far found are in the neighboring territory of Newfoundland, though it is intimated that Newfoundland is nearer than ever to being made a part of the Dominion. It is rather surprising that such confident predictions are made by Canadian writers, and are repeated in Mr. Jeans' work, of the advance Canada is to make in iron and steel, when so little is known as to the quantity of iron ore available, while it is certain that much is lacking as to quality. The bounty system that has bolstered the Canadian iron industry in recent years is taken up with some detail and its workings thus far commented on, a table being given to show how much has been paid out since 1884. In the fiscal year ending June 30, 1903, the total bounties paid by the Dominion of Canada to iron and steel makers amounted to $1,245,382.

A very optimistic view is taken in the book of the future of Canada, and it is confidently predicted that her population of 6,000,000 will be greatly increased within the near future. The policy of preferential duties on imports from Great Britain is naturally commended, and it is expected to figure in an important way in the growth of the future. The prediction of a well-known Canadian is repeated, namely, that in fifteen years Canada is likely to have a population of 20,000,000.

The book is a valuable one, and when its scope is considered it seems strange that it should have remained for an Englishman to prepare such an excellent commentary on the present industrial condition of Canada. Like Mr. Jeans's report on the American iron and steel industry, which made a stout volume that has been widely circulated in the iron trade in this country, this Canadian volume brings together a mass of information not paralleled in any single publication of the country of which it treats.

G. A. Tomlinson, of Duluth, on Aug. 16 closed a contract with the American Shipbuilding Co. for a freight steamer which will be the second largest carrier on the lakes. This is the first order placed with a lake shipyard for a vessel for 1905 delivery. The new boat, which will be six feet longer and one foot deeper than the steamer Sahara of the Tomlinson fleet, which in size is next to the Augustus B. Wolvin, will be built at Lorain. She will cost about $360,000 and about 3,000 tons of material will be used in her construction. The big freighter will be 500 feet over all, 480 feet keel, 52 feet beam and 30 feet deep. She will carry 9,000 tons and will have twenty-eight hatches. She will have a hopper cargo hold like the Wolvin but with straight sides. Work on the new boat will be started as soon as the material reaches the shipyard, and according to the contract she will be completed and ready for business April 15, 1905.

Concerning the press report that the Colorado Fuel & Iron Co. has just closed the purchase of iron ore properties in Wyoming which it has held heretofore under lease, the lands including the Sunrise ore mine, we are officially advised to the following effect: The reports refer merely to the favorable termination of litigation pending for years, and to the issuance of a deed for property that has been held and operated by the company pending final decision.

The plant of the Stilwell-Bierce & Smith-Vaile Co., at Dayton, O., was sold at auction on Aug. 11, under an order of the United States District Court to Col. J. D. Platt, the president of the Barney & Smith Car Co., of Dayton, O. The purchase price was $775,000, which is $119,202.50 less than two-thirds of the appraised value. It remains for the judiciary to confirm the sale. There were no other bidders. It is thought by those informed in the matter that the court will confirm the sale on the bid made by Mr. Platt.

A portion of the new plant of the Orient Coke Co., Uniontown, Pa., was placed in operation this week. There are 300 ovens and it is expected to have the entire plant in operation within a few weeks. The company owns 1,200 acres of coal land, the coal being of excellent coking quality.

The machinery and machine tool concerns of Cincinnati have been visited by a representative of World's Fair officials and asked to take special interest in Machinery Day at the exposition, Sept. 10. It is expected that a special train will go from Cincinnati.

The chemical plant of the Cleveland-Cliffs Iron Co., at Gladstone, Mich., was struck by lightning Aug. 15 and entirely destroyed. The loss is about $100,000, with no insurance.

The sheet and tin plate mill of the Follansbee Bros. Co., at Mahan Station, W. Va., opposite the city of Steubenville, will be placed in operation on Monday, Sept. 5. The plant contains six sheet and two tin mills, operated by a C. & G. Cooper Duplex Corliss engine, four mills being located on either side. A tin house has been erected of sufficient capacity to take care of the product of the tin mills, and the plant further contains seven cold mills and seven annealing furnaces. No galvanizing department has been erected although this may be added in the future. Wallace Banfield, formerly district manager for the American Tin Plate Co., is a large stockholder and will manage the plant.

OBITUARY.

George A. Chalfant, one of the pioneer pipe manufacturers of the Pittsburg district, died at the Harper Hospital, Detroit, Mich., on Thursday, Aug. 11. On the Saturday preceding his death, Mr. Chalfant, while walking in his sleep, fell from a window at his summer home on Star Island, near Detroit, sustaining a broken arm and internal injuries. The announcement of his death was a surprise to his friends who were advised that he was steadily improving and out of danger. George A. Chalfant was born March 3, 1841, near Turtle Creek, Pa., and after graduating from Jefferson College in 1861 he entered the employ of Spang, Chalfant & Co. as a clerk. He became in time a partner and general manager, in which position he served until Jan. 1, 1902, when he retired. The Etna Iron Works, as the concern was first known, were erected in 1828. Later the firm name was changed to Spang & Co., the firm consisting of Charles F. Spang and James McAuley. In 1858 the firm of Spang, Chalfant & Co. was organized, the partners being Charles H. Spang, John W. Chalfant, C. B. Herron and George A. Chalfant. In 1878 the Spang Steel & Iron Co. was organized as a branch, of which Mr. Chalfant was general manager. In addition to the Etna Iron Works, he was connected with many Pittsburg financial institutions and was the first to use natural gas as a fuel in the Pittsburg district. Charles F. Spang, the former business partner of the deceased, died at Nice, France, about two weeks ago at an advanced age. Mr. Chalfant is survived by his widow and four children.

William J. McWellis, constructing engineer at the tube mills of the National Tube Co., at Lorain, O., died at the hospital at Lorain Aug. 15. The remains were sent to Johnstown, Pa., for burial.

William T. Rainey, aged 38, and head of the extensive interests of his father, the late W. J. Rainey, in the Connellsville coke region, died Aug. 13 at his home in New York. After his father died in 1900, he had entire charge of the business.

Florence Sennett, widow of Geo. B. Sennett, who was head of a well known Youngstown, O., foundry and machine shop, died in that city Aug. 13. Mrs. Sennett had succeeded her husband as president of the company.

New England Foundrymen's Association.

The regular monthly meeting of the New England Foundrymen's Association was held at Providence, R. I., Thursday, Aug. 11, and took the form of an outing at the Squantum Club. It was voted that all business be dispensed with and a rising vote of thanks was extended to Mr. Fenner for the courtesy extended in opening the club to the association. Announcement was made that the next meeting would be held Sept. 14 at the Exchange Club, Boston, Mass. Keneth Falconer will be the principal speaker and will address the members on "Factory and Foundry Systems." The outing was participated in by 76 persons and was highly successful.

British Foundrymen's Association.

The newly organized British Foundrymen's Association held a meeting at Owens college, Manchester, Eng., on Thursday, Aug. 4. Robt. Buchanan was in the chair and delivered a presidential address. The secretary, F. W. Finch, read a report detailing the steps for the formation of the organization. Eighty-three members had been enrolled, of whom 68 are from England, 8 from Scotland, 6 from Wales and 1 from Ireland. Mr. Buchanan in his address dealt mainly with the technical side of foundry work. It was the observation of foundrymen that the elementary teaching was inadequate, judging from the young men who came to their works. Percy Longmuir read a paper on the "Structure of Metals and Alloys," illustrating it with photo-micrographs of typical specimens of cast iron, steel, brass and bronze used in foundry practice. W. P. McCall read a paper on "Strength Tests of Cast Metals." Both papers were discussed at length. The members visited the works of the British Westinghouse Co. and of Craven Bros.

PERSONAL.

Frank Wiley, manager of the Atlantic Foundry, Akron, O., was severely injured on Aug. 15 by a heavy casting falling upon him.

J. T. Wheeler, formerly associated with the Field-Evans Iron Co., Chicago, as sales representative, has accepted a similar position with the C. A. Stevenson Pig Iron & Coke Co., Fisher building, Chicago.

Roscoe Cornell has been appointed manager of the branch office of the Allis-Chalmers Co. has just opened in El Paso, Tex. Mr. Cornell had been connected with the Mine & Smelter Supply Co., of Denver. He is a graduate of the Michigan College of Mines.

James W. Lyons has resigned as manager of the power department of the Allis-Chalmers Co., the change taking effect on Aug. 13. Mr. Lyons has accepted an appointment as consulting engineer to the Elgin Watch Co., of Elgin, Ill., which will erect new and extensive works under his supervision. He will also engage in other consulting work and his headquarters will be at Chicago.

Ephraim Bayard, who has been superintendent of the Bessemer department and blooming mills of the Cleveland works of the American Steel & Wire Co., has been made general superintendent of the Shoenberger plant and is succeeded at Cleveland by J. B. Clark, transferred from the Shoenberger plant, where he was superintendent of the Bessemer department.

Iron and Steel Works' Wages in Germany.

Under date of July 9, 1904, United States Consul-General Guenther, of Frankfort, Germany, transmits the following tabular statement taken from the *Frankfurter Zeitung*, showing the average annual wages earned by workmen over 16 years of age, in the mining and iron and steel industries of Upper Silesia, Germany, for the five years, 1899-1903.

AVERAGE ANNUAL WAGES PER CAPITA IN THE MINING AND IRON INDUSTRIES, UPPER SILESIA.

Industry	1899	1900	1901	1902	1903
Mining:					
Coal	$218.23	$242.28	$245.24	$231.41	$238.71
Iron ore	146.43	155.48	173.81	179.08	.....
Zinc and lead ore	178.30	198.57	207.14	206.19	192.86
Steel and iron industry:					
Furnaces	221.67	234.76	251.43	235.95	244.29
Rolling mills	219.52	121.43	216.19	216.19	218.57
Iron foundries	204.52	205.48	214.29	210.00	211.67
Wire, ropes, nails, etc	206.91	221.67	217.38	224.87	220.48
Zinc, lead and silver works	215.72	234.28	235.24	232.14	234.05
Coke ovens	197.14	216.43	225.24	225.00	221.48

The New England Steel Casting Co. has acquired the business of the Pope-Robinson Steel Co., of Hyde Park, Mass., and is making at that place high grade crucible steel castings, the majority of the output being used in automobile work. The plant acquired was fully equipped. The company finds business very good and its castings meeting with good success with the automobile builders. Eugene Edwards is president of the company and J. W. Johnson treasurer.

The B. F. Sturtevant Co. is fitting up quarters in its big plant, at Hyde Park, Mass., to be used for an emergency hospital in case of accident to employees. The equipment will comprise all the appliances known to medical and surgical science for the proper care of the men, who may get injured in the discharge of their duties, until they can be removed to their homes. A graduate nurse and medical student will be in charge and a local doctor will attend to all surgical cases.

The annual meeting of the Grand Rapids Malleable Iron Co., Grand Rapids, Mich., was held last week. The following officers were elected: President, Edward Lowe; secretary, D. M. Ray; treasurer, H. J. Hollister; manager, L. C. Packham. The reports for the past year show a fair profit and a dividend was declared.

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ROBERT L. CLEGG, - - EDITOR MACHINERY DEPARTMENT.
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AUGUST 18, 1904

OUR ENORMOUS IRON AND STEEL CAPACITY.

While the late boom in the iron trade was at its height, details were published in these columns of blast furnace, steel works and rolling mill construction work then under way or projected, which would make very considerable additions to the producing capacity of the country in all iron and steel lines. Some of these enterprises were not carried out on the scale originally projected, but for the most part the promised additions to our capacity in pig iron and steel have materialized. The impressive total of the tonnage represented in these new works appears in the new directory of the American Iron and Steel Association, extracts from the preface of which are given elsewhere in this issue. The statistics emphasize again the rule that has always governed additions to our iron and steel capacity—important increments of capacity, principally through the building of new works, are made in times of high prices for labor and equipment, in other words, when the iron trade is enjoying a boom. When the reaction comes—a time when construction work could most cheaply be carried on—nobody wants to build. It is to be noticed also that the completion of important additions to our iron and steel capacity and their starting up are usually coincident with a time of diminishing demand and declining prices. This is one of the phases of the present depression in the trade, and one that has not been given due consideration apparently in some forecasts that have appeared. The enormous and unprecedented producing outfit of modern type, managed by experienced men and in the hands of strong companies controlling their own raw materials, is the prime factor in the steel situation in the United States today.

Our blast furnace capacity today is put at 27,675,000 tons, as compared with 24,800,000 in 1901. Many of the 410 furnaces counted as live cannot make $11 pig iron on today's basis, to be sure, or even $12 iron, and some of them will not be called from the idle list by anything short of $15 iron; but the significant fact is that our capacity to produce pig iron has grown enormously in recent years. In 1898, when the improvement in the iron trade began that culminated last year, we had a capacity closely estimated at 18,000,000 tons. Today it is more than 50 percent greater.

In steel-making capacity, as is well known, the increase has been largely in basic open-hearth plants. The record of Bessemer works is noteworthy for the number of small Bessemer outfits added since 1901. The annual capacity of 100 Bessemer converters in 1901 was 12,998,700 tons and of 103 Bessemer converters in 1904, 13,628,600 tons. The open-hearth exhibit shows the annual capacity of the 549 completed and 28 building open-hearth furnaces in June, 1904, to be 11,335,100 tons of ingots and direct castings, as against 8,289,750 tons in November, 1901, an increase of 3,045,350 tons.

When it is considered that so large a proportion of our steel making capacity today is well located, is built on modern lines and is operated under methods yielding high economies in production, any expectation of continued high prices for steel while steel consumption is at the rate of 11 to 12 million tons a year, is apt to end in disappointment.

THE STATUS OF THE AUTOMOBILE.

The automobile season is closing from the manufacturer's point of view, though the indulgence in what may fairly be called an all-year-round enjoyment continues with much vigor. There is quite a little in common with the history of the bicycle, for scarcely has one maker outlined his course and designed his product to meet the current ideas of automobile excellence when the wheel of public favor moves round to another notch and the work of construction starts anew. This is so generally the case that it is the gossip of the trade that one prominent manufacturer decided upon an output of a thousand machines and proceeded to order all his supplies upon that basis. The machine in its latest form had a good reception and report credits the builder with the sale of his stock thus early in the year. No more are to be made of the type at present and all that is now necessary is to clean up the manufactured parts on hand. This does not seem the most likely course for the treatment of public demand, but it is said that the builder is not so much concerned with this showing of the case as with the prospect of the coming year and the proper way to serve the new season's applications for automobiles.

At present there is seen an increasing demand for larger cars and more powerful engines. The runabout of two or three years ago followed the lines laid down by the builders of the Stanley machine of 1895. Everything was pared away to such an extent that the closely trimmed and pruned mechanism seemed to have reached its final analysis in stripping to the bone and sinew. The early steam machines of nine years ago and less were modeled on bicycle lines and the components of that vehicle entered largely into the construction of the larger competition of the horse-drawn carriage. The steam boiler of the locomobile was a marvelous piece of work aside from the wire and other mystery in which it was wrapped at an early stage. Nothing so powerful and of such light weight had

been contemplated by the other workers of the time with any certain hope, and the scheme was at once seized upon with avidity. Since that time the boiler and the feed of steam-propelled machines have been considerably improved and the latest model of this type seems as near automatic excellence as can well be desired.

The explosive engine or combustion motor, receiving its source of energy from a supply of gasoline or similar oil, has not been overlooked in the production of improvements. The interval between the working strokes of a four-cycle engine was not agreeable to the pioneers and a great deal of painstaking labor has been spent on two-cycle engines as well as on engines with two or more cylinders. The success of a few manufacturers with simply constructed single-cylinder machines led readily to the adoption of that design as practically the standard and for a number of years the trade has discarded the multiple cylinders found in the old Duryea wagons. Last year there were pronounced symptoms of a return to first principles in automobile construction and this year many of the popular machines have opposed cylinders. The two-piston or perhaps an even greater number of cylinders is likely to be the standard for next year's design.

The electric machine with all its freedom from apparent care on the road does not meet the pace set by the other types and is indeed far from being in step with them. Excellent automobiles driven by electric motors are on the market and in sweetness of running and ease of operation hold an eminence peculiarly their own. Nevertheless the restricted zone of operation, the dependence upon a time wasting source of power repair and the battery weight which loads the machine heavily, all hamper the progress of this cleanly competitor for purchasers' favor. Announcements have been freely made of notable inventions by Edison and others in storage battery construction which would lift the electric machine at once into prominence as a formidable force in the automobile market, but these expectations have not prospered to any great extent and the heralded improvements due to new patents and the free use of many old ones—now public property by expiration of the time limit—are still but partly fulfilled. In general it is to be said that the several types are doing good service and giving quite general satisfaction where the selection has been judiciously made with due regard to the especial need and circumstances of the owner.

In the racing field each type has made remarkable records. The racing furor which marked the rise and fall of the bicycle has not, however, reached the same stage in the case of the automobile. Races have been held and some startling records of human skill in construction as well as in control of machines have been made; but there have not been the crowded gatherings of the days when the League of American Wheelmen was in its lusty prime. There has been more danger and at the same time fewer events on the track at a single meet, and this also counts for something in the way of enthusiastic attendance and general interest. Accidents were not uncommon at the League meets, but there was not the tremendous speed or the weight with which the modern racing car plunges at its maximum limits. There is the same human factor in each case, but with the automobile the greater momentum leaves less scope for recovery from an error of judgment, a defect in vision or that momentary weakening of the nerves that high physical and mental strains may produce at a critical time. Little indeed has been learned from the racing tests of the automobile, and the well understood fact that most if not all the cars were specially built for the occasion and not for ordinary purposes failed to have the influence that under other circumstances might have been exerted on the prospective purchaser.

The horse, in spite of all the improvements in the autocar—and the work accomplished is decidedly meritorious—still holds his own in the streets, and the anticipated horseless age still lies in the field of prophecy. That the heaviest kind of transportation in the streets will become the task of the self-propelled wagon is to be expected, and lovers of the horse will welcome the day when he is to that extent relieved of his burdens. A number of tests made with vehicles for hauling, under the auspices of the Automobile Club of America, have given quite promising results and the work is going on, slowly but surely. Apart from these experiments, however, the automobile campaign is along pleasure carriage lines almost exclusively. When the demand for these diminishes, either by change in fashion or for other causes, then the possibilities of the business will center about the carrying problem applied to commerce. We cannot doubt that the demands will be as creditably met as in the beautifully finished machines now competing with the horse-drawn pleasure carriage.

From the Furnaceman's Standpoint.

An Ohio furnaceman writes *The Iron Trade Review* as follows on the present situation from the standpoint of Northern blast furnace interests:

"At present lake ores are out of line at least 50 cents per ton, as the furnaces of the South can make and sell pig iron at a little profit, whereas Northern furnaces cannot. To put it another way, the Northern furnacemen are obliged to sell at cost or less to get business as against Southern producers. Quarterly reports indicate that Southern plants working under favorable conditions are more than holding their own. If the price of Lake ores is not reduced Northern producers must meet present conditions as best they can until there is sufficient demand for and consumption of pig iron to advance prices to a profitable basis. Just when that will come is the question of the hour. We all expect it, and are living on the hope of it. Whether the change will be of slow growth, almost imperceptible, or take place swiftly during a night, taking us by surprise, I am not prepared to say. During the past five years we have been swept off our bearings, and calculations as to 'where we are at' are not trustworthy. I am sure I don't know, and am confident of only one thing: that pig iron in the long run will be made at a profit. The ups and downs are a little too pronounced for comfort of mind and peace of soul, to say nothing of the wear and tear of body, but if we live long enough we may see more stable conditions. Mr. Schwab's views are at least cheering, and if the past is any criterion of the future we should not be among those who are without hope."

The Cincinnati Machine Tool Co., of Cincinnati, has now completely moved the plant and is located in the new building at Spring Grove avenue and Township street in that city. The new works are designed particularly for the manufacture of upright drills, and an invitation to visit the plant is extended by the firm to all interested parties.

The Labor Situation.

ANOTHER VICTORY FOR THE OPEN SHOP.

In a decision handed down a few days ago by the Appellate Court of Illinois in the case of the Kellogg Switchboard Co. the court dealt a severe blow at the closed shop and incidentally at the Anti-Injunction bill which is before Congress. The Kellogg Switchboard case is one of those about which the Anti-Injunction bill revolves, it being one of the principal sources of complaint of the labor unions against the use of the Federal injunction in labor disputes that by its application in the case of the switchboard company's strike they were prevented from winning the strike. The American Anti-Boycott Association took up the case of the Kellogg company, which was one of its members.

The question at issue was brought about by the demand of the unions that the company should execute an agreement that none but regular members of the unions should be employed, together with regulations providing for the exercise by the unions of authority to enforce the agreement.

Defeated in the lower court, the unions appealed, and the Appellate Court has now sustained the injunction unanimously. In doing so the court takes occasion to note that the unions sought to compel the company to execute a contract in duress and that "duress exists when a person is induced to perform an act to avoid a threatened or impending calamity." The court points out that "especially was the purpose to compel complainant to execute the agreement in question an unlawful purpose. Article one of the agreement strikes at the right of contract and provides that complainant shall employ none but persons of the several unions, thus discriminating in favor of one class of men and excluding all others."

The court holds that an employer whose workmen have left him and gone on a strike, particularly when they have done so without any justifiable cause, "is entitled to contract with other laborers or workmen to fill the places of those who have left him. Any workman seeking work has a right to make a contract with such employer to work for him in the place of any one of the men who have left him to go out on a strike."

The opinion holds that it has been well said that the privilege of contracting is both a liberty and a property right, liberty including the right to make and enforce contracts, because this right is included in the right to acquire property. Liberty is property, and to deprive the laborer and the employer of this right to contract is a violation of the Constitution of the State of Illinois. It is further held that it is equally a violation of the Fifth and Fourteenth Amendments to the Constitution of the United States. "The agreement in question would, if executed, tend to create a monoply in favor of the members of the different unions and is in this respect unlawful. Contracts tending to create a monoply are void."

PRESIDENT SHAFFER ON CONTRACT-KEEPING.

The contract men employed on four of the improved mills of the upper works of the Carnegie Steel Co., Youngstown, O., returned to work on Monday morning, and the mills have since operated in full. The salaried men who returned to work are also members of the Amalgamated Association. The stand taken by President Shaffer on this matter is interesting in contrast with the position he assumed three years ago during the strike. At that time he stated that the affiliation of men with the Amalgamated Association stood above all contracts which they may have with their employers and on this ground ordered the men out at Milwaukee and Chicago. In his letter to the Carnegie salaried employes he states that the association cannot abjure contracts. President Shaffer writes as follows. "After carefully considering the situation between the Carnegie Steel Hoop Co. and some of its employes who are members of the Amalgamated Association and recollecting that during our strike against the United States Steel Corporation these employes were in receipt of salaries without rendering returns of any kind and inasmuch as the annual agreement is legal and the Amalgamated Association cannot abjure contracts and as the action of the Wheeling convention is a confirmation of such annual contracts, I hereby, express the opinion that all such Amalgamated individuals keep inviolate their contracts until the contract period shall terminate. I trust that our members will return to work when called upon to do so by the proper officials and continue at work until the term expires or satisfactory arrangements are made with our organization."

It is believed in some quarters that the outcome of the matters at issue between the Carnegie Steel Co. and the Amalgamated Association relative to the hoop mill at Youngstown will be the operation of the plant as an open mill.

MACHINISTS' UNIONS MERGED.

After a conference lasting several days in Cleveland, the officers of the International Association of Machinists and the International Association of Metal Mechanics agreed Aug. 16 on a plan for consolidating the two unions under the name of the former, the plan to take effect Oct. 31.

The amalgamation of the two organizations will give the International Association of Machinists jurisdiction over the workers employed in machine shops throughout the United States and Canada. The International Association of Allied Metal Mechanics has 200 local unions throughout the United States and Canada, with a total membership of over 22,000 men. The International Association of Machinists has 700 locals with a total membership of 80,000 men.

The International Association of Allied Metal Mechanics has had jurisdiction over special skilled men employed in machine shops, such as the workers on sewing machines, typewriters, cash registers, guns and automobiles. The question of jurisdiction over different workers in the machine shops has given the two unions much trouble and the American Federation of Labor at its last convention told them to get together. The representatives of the organizations met in Toledo in December but failed to arrive at any agreement. The matter of amalgamation was then submitted to a referendum vote and was acted upon by both.

BUILDING TRADES' STRIKE IN NEW YORK.

Conditions in the strike of the building trades unions in New York have not improved, although a number of local unions have received leters from national organizations refusing to approve sympathetic strikes.

The unsettled state of affairs in the building trades promises to be more unsettled on or before August 22, when the Building Trades Employers' Association's declaration of open shop against the unions which went on strike in violation of the arbitration plan goes into effect. The Employers' Association are prepared for a long fight if the striking unions do not return to work by August 22 and thereby avoid the open shop issue. The employers realize that the indiscriminate employment of non-union labor will in all probability involve all of the thirty-two unions in the building trades, and that some of the unions will die hard. Open shop is already in operation on the subway.

STRIKING MOLDERS ENJOINED.

(Special Telegram.)

PITTSBURG, Aug. 17.—The striking molders at the Pittsburg Steel Foundry, Glassport, have been temporarily enjoined from interfering with men at work. The attempt to operate the plant as an open shop has been entirely successful so far as getting a sufficient number of competent men is concerned.

NATIONAL FOUNDERS' ASSOCIATION.

A second meeting has been held of the Cincinnati locals of the Iron Molders' Union, whose members are affected by the reduction of 20 cents a day which the foundrymen announced would become effective Aug. 15. The action previously taken informally was reaffirmed in an official way, refusing to accept the reduction. A conference committee of local foundrymen met with representatives of the molders on Aug. 10, but it was found that no compromise would be made, the employers standing firm in their decision. A meeting has now been arranged between representatives of the two national bodies, to be held at the Grand hotel on Tuesday, Aug. 23. The men will remain at work until the outcome of this meeting is announced.

The National Founders' Association officially announces that the New York agreement has been abrogated in eight leading foundry centers, owing to "the refusal of the union advisers to accept reasonable terms." The cities are Indianapolis, Worcester, Mass., St. Louis, Minneapolis, St. Paul, Coxsackie, Pittsburg and Montreal. In addition to the above there have been local conferences in Cleveland and Milwaukee without result and in these cities no agreements exist at present.

Referring to the present policy of the Iron Molders' Union in regard to changes in wages and shop conditions that shall put the foundry industry in line with the changed business conditions throughout the country, a recent circular of the National Founders' Association to its members says: "While the problem of agreeing to certain changes in wages or shop conditions in a national conference seems to present insurmountable difficulties to the officials of the union, yet they have in a few instances agreed to them with proprietors, if in their judgment the concessions granted could retain a sub-rosa status. It is indeed quite evident the policy which is dictating this course is simply an effort to tide over what may possibly be only a temporary falling off in the demand for union labor, but it will be interesting to note where this propaganda will seek shelter when the abnormal revival in business, of which they are now preaching so much, fails to put in an appearance."

NATIONAL METAL TRADES ASSOCIATION.

CINCINNATI, Aug. 16.—In regard to the value of establishing employment bureaus the following letter has been received from President Steedman, of the St. Louis Metal Trades Association: "Permit me to say that in St. Louis we believe that the employment bureau is the most important feature of the association's work. It is a great saving in time and annoyance in procuring men and it is of the greatest benefit to us, as we know exactly what the labor market is in this city at all times. We have had four or five small strikes in our city in the last six months and our employment department has procured men and filled the shops in every case in a remarkably short space of time and practically without any extra expense."

The strike against the W. & A. Fletcher Co., Hoboken, N. J., continues with unabated vigor. The company is, however, in fair condition and the boiler shop is turning out practically all its work.

The result of the vote by the International Association of Machinists on the subject of the agreement with the Amalgamated Society of Engineers has not been announced. It is understood that this society was driven to the approval of the agreement by the discrimination of employers against its members.

The Worthington Pump Works, of Elizabeth, N. J., have posted notice of a 10 percent cut in wages in all departments to go into effect Aug. 17.

The Chicago Metal Trades Association has adopted the following plan in taking back old men: "A list should be made of the men whom under proper conditions you would be willing to re-employ from the men who struck in your shop. No former employes should be taken back except after they have been sent to the bureau and registered there and sent back to the member with a card from the bureau. Where former employes whom you might wish to re-employ apply in a body the bureau must in no instance send more than one or two at a time and never on the same day that the application is received."

The molders' union of Milwaukee made request for a conference with the foundrymen in that city. A hearing of the parties was held July 7, but later the foundrymen decided that under the conditions it was unnecessary to make any agreement with the union and they were so notified. Nothing has been heard of the matter since.

LABOR NOTES.

Twenty-three molders in the employ of the R. D. Wood Co., Camden, have gone on strike for shorter hours and an increase in wages. The insistence of the company upon a 60-hour week was the principal cause of the strike.

A partly successful attempt was made last week to wreck the plant of the West Side Foundry Co., Colonie, N. Y., with dynamite. A strike has been in progress at the plant since April 19. The company has obtained two court injunctions restraining its former employes from picketing its premises and interfering with the men at work.

The strike of the boilermakers of the New York, New Haven & Hartford system has been settled and about 300 men have returned to work. The men get an increase of two cents an hour, a nine-hour day and other improved conditions of work.

The controversy at the plant of the Stark Rolling Mill Co., Canton, O., has been settled. It is understood that the settlement was made on the terms of the company.

Evidence has been discovered of a conspiracy on the part of strikers to wreck the Vulcan Iron Works, 80 North Clinton street, Chicago. The police discovered an iron box filled with dynamite sticks in some bushes near the foundry and also a large amount of explosives in the home of one of the striking employes. The striker is under arrest.

The strike of the machinists of the Phœnix Iron Works, Meadville, Pa., inaugurated April 1 has been declared off, and the men returned to work Aug. 12, the differences between the strikers and employers having been amicably settled.

International Harvester Co. Operations.

CHICAGO, Aug. 16.—The International Harvester Co. has shut down the blooming mill and Bessemer department at its works at South Deering for a short period, though the merchant mill, which has been idle for a short time, has been started up again. Only one of the blast furnaces at this plant is running, although it is expected to blow in the other in a few days and operate both continuously after that time. All of the manufacturing plants, including the Plano, Deering, McCormick, Milwaukee, Champion and Hamilton, Ont., will be started up again on Sept. 1, after being idle since Aug. 1. It has always been the custom to shut down these plants each summer for a period of from two weeks to two months, during which, repairs were made, inventory taken, and designs for the new machines to be made the following season decided upon. The suspension this year has been shorter than usual, and the reports that the company is contemplating further continuance of the shut down or reduction of its force are untrue. Officials of the company say that when the works start up on Sept. 1 a full complement of men in all departments will be at work.

Geo. G. Blackwell, Sons & Co., Ltd., of Liverpool, who are probably one of the most American of British firms in enterprise and in the use of up-to-date methods of publicity and of selling, have just issued the fifth edition of their pamphlet on "S. A. Alloy," a modification of S. A. M. alloy. The adaptation of the alloy to the needs of steel and iron founders is presented with some little detail. Its use in the production of chilled castings is explained and it is stated that it has been employed to convert common white iron into gray iron and to produce the required depth of chill in castings. Directions are given for the prevention of carbon entering the combined state, for the use of an alloy for malleable castings, for the production of solid and close cylinder castings, for the softening of iron and for the production of tough gray iron castings.

The Cincinnati Iron Store Co., of Cincinnati, has been appointed distributer for the products of the Lackawanna Steel Co. in Ohio, Indiana, Kentucky, Tennessee and the entire Southern territory. Plans of the Cincinnati Iron Store Co. include the erection of a large warehouse at Front street and Freeman avenue, Cincinnati, the intention being to erect a two-story brick building 100 x 275 feet.

Negotiations are in progress to lease the foundry and manufacturing plant of the William Bayley & Sons Co., Milwaukee, Wis., to the Nordberg Mfg. Co.

OUR IRON AND STEEL WORKS CAPACITY AT DATE.

The American Iron & Steel Association will publish on Aug. 25 the sixteenth edition of its Directory to the Iron and Steel Works of the United States, corrected to Aug. 1, 1904. With two unimportant exceptions every line of information in this volume is obtained direct from the manufacturers. The directory contains 484 pages, or 40 pages more than the directory of 1901, and is a larger volume than any of its predecessors. General Manager Swank comments as follows in the preface of the book, of which we have received an advance proof, on the number of producers of iron and steel in the United States, as affected by the formation of consolidations:

"The opinion has been frequently expressed that the organization in the iron trade in recent years of many so-called 'trusts,' particularly of the United States Steel Corporation, would result in a serious check to individual enterprise or to the enlistment of comparatively small firms and companies in the manufacture of iron and steel. An examination of the present edition of the directory will show that apparently precisely the opposite effect has been produced, or at least that the 'trusts' have not interfered with the growth of our iron and steel industries under independent auspices. A surprisingly large number of independent iron and steel plants have been built in the last few years, while many old and well established companies have greatly increased their capacities in these years for the manufacture of iron and steel. Especially has there been a marked development of independent enterprise in the manufacture of iron and steel specialties, of which steel castings may be mentioned as a leading example."

The following summary is given in the preface, of the number and capacity of iron and steel works in June, 1904, as compared with November, 1901:

In the grand summary the following tabular presentation is made of the present number and capacity of the various descriptions of works:

NUMBER AND CAPACITY OF IRON AND STEEL WORKS.

	June, 1904	November, 1901
Number of completed Blast Furnaces—296 bituminous, 71 anthracite and coke, 5 anthracite alone, and 56 charcoal: Total	428	406
Electric furnaces	5	.....
Blast furnaces building and rebuilding	17	12
Annual cap. of completed blast furnaces, gr. tons	28,114,000	24,812,437
Annual capacity bituminous furnaces, gr. tons	24,242,500	20,771,200
Annual cap. of anthracite and anthracite and coke furnaces, gross tons	3,019,900	3,190,087
Annual cap. charcoal furnaces, gross tons	851,600	706,750
Annual cap. of mixed charcoal and coke furnaces	.....	144,000
Completed rolling mills and steel works	572	527
Rolling mills and steel works building and rebuilding	13	29
Single puddling furnaces (a double furnace counting as two single furnaces)	3,161	3,251
Heating furnaces	3,995	3,723
Annual cap. in finished products of completed rolling mills, double turn, (omitting forged products)	25,978,050	23,220,350
Cut-nail works connected with rolling mills	23	32
Cut-nail machines	2,302	3,161
Completed standard Bessemer steel works	32	35
Standard Bessemer converters	75	81
Annual capacity of these converters (built and building) in ingots and direct castings, gr. tons	13,551,000	12,938,000
Completed Clapp Griffiths steel works	1	1
Completed Clapp Griffiths converters	1	1
Completed Robert-Bessemer steel works	2	2
Completed Robert-Bessemer converters	3	3
Completed Tropenas and special Bessemer Steel works	16	9
Completed Tropenas and special Bessemer converters	24	15
Annual cap. of all Bessemer converters, (built and building) in ingots and direct castings, gr. tons	13,628,600	12,998,700
Completed Open-hearth steel works	135	112
Open-hearth steel works building	5	12
Open-hearth steel furnaces—249 completed, 22 building, and 6 partly built	549	403
Annual cap. of these furnaces (built and building) in ingots and direct castings, gross tons	11,335,100	8,298,750
Completed crucible steel works	57	45
Building crucible steel works	.....	3
Steel-melting pots in completed works	3,606	2,896
Annual cap. of pots in ingots and direct castings	226,610	175,000
Completed tin-plate and terne-plate works	53	55
Tin-plate and terne-plate works building	2	7
Forges making wrought iron from ore	1	2
Annual cap. in blooms, double turn gr. tons	6,000	6,075
Completed pig and scrap iron bloomaries	8	8
Building pig and scrap iron bloomaries	1	.....
Annual cap. of completed and building pig and scrap iron bloomaries, double turn gr tons	41,300	25,375

The distribution of blast furnaces by States is as follows: Massachusetts, 2, 9,000 tons; Connecticut, 3, 15,000 tons; New York, 22, 1,520,000 tons; New Jersey, 12, 546,000 tons; Pennsylvania, 155, 11,225,200 tons; Maryland, 6, 421,000 tons; Virginia, 26, 890,500 tons; West Virginia, 4, 425,000 tons; Kentucky, 8, 235,000 tons; Tennessee, 22, 813,600 tons; North Carolina, 1, 35,000 tons; Georgia, 4, 123,500 tons; Alabama, 49, 2,819,000 tons; Texas, 4, 72,500 tons; Ohio, 61, 5,256,700 tons; Illinois, 22, 2,275,000 tons; Michigan, 11, 394,000 tons; Wisconsin, 6, 355,000 tons; Minnesota, 1, 80,000 tons; Missouri, 2, 70,000 tons; Colorado, 5, 500,000 tons; Washington, 1, 18,000 tons; Oregon, 1, 15,000 tons. The total capacity of anthracite and coke furnaces is 27,262,400 tons, and of charcoal furnaces, 851,600 tons, the grand total being 28,114,000 tons. In addition to the furnaces enumerated above two furnaces in Virginia and three furnaces in West Virginia were equipped for the production by electrcity of ferro-chrome, ferro-silicon, ferro-tungsten, and other ferro alloys.

On June 1, 1904, there were 17 furnaces in course of erection on being rebuilt, located in the following States: New York, 3 bituminous; Pennsylvania, 5 bituminous; Virginia, 1 bituminous; Alabama, 2 bituminous; Ohio, 4 bituminous; Michigan, 1 charcoal; and Colorado, 1 bituminous; total, 16 bituminous and 1 charcoal. In addition there were 8 furnaces which were projected, one of which was partly built and work on it indefinitely suspended, located in the following States: New Jersey, 1 anthracite alone; Pennsylvania, 1 anthracite and coke (partly erected); Alabama, 3 bituminous; Ohio, 1 bituminous; Missouri, 1 bituminous; and Utah, 1 charcoal and coke mixed.

The table on p. 53 gives by States the number and capacities of rolling mills and steel works:

Blast Furnaces.—The directory for 1901 described 406 completed furnaces as being then active or as having been reported as likely to be some day active. The annual capacity of these furnaces amounted in round numbers to 24,800,000 gross tons, not all of which capacity could, of course, be employed at the same time, nor would some of the furnaces enumerated ever run again. In the present edition are described 428 completed furnaces, either active or reported as likely to be some day active. Eliminating some of the furnaces in the latter category as being dead for all time, there remain about 410 live furnaces today. The annual capacity of these furnaces in round numbers is 27,675,000 gross tons. The actual production of pig iron in 1903 was 18,009,252 gross tons. Since 1901 21 furnaces have been transferred to the abandoned, dismantled, or inactive list.

Furnaces Building.—When the directory for 1901 appeared 12 furnaces were being built, namely, 2 in New York, 1 in New Jersey, 3 in Pennsylvania, 1 in West Virginia, 2 in Alabama, 1 in Michigan, and 2 in Colorado. The present edition enumerates 17 furnaces in course of erection or as being rebuilt, namely, 3 in New York, 5 in Pennsylvania, 1 in Virginia, 2 in Alabama, 4 in Ohio, 1 in Michigan, and 1 in Colorado. The figures for both years do not include projected furnaces or furnaces that had been undertaken and work upon which had been suspended.

Fuel Used in Blast Furnaces.—The 406 furnaces described in the edition for 1901 were classified as follows: 55 used charcoal as fuel, 5 used mixed charcoal and coke, and 346 used anthracite and bituminous fuel. Of the 428 furnaces that are now described 56 use charcoal and 372 use anthracite and bituminous fuel. No furnaces now use mixed charcoal and coke. Five furnaces, not included above (2 in Virginia and 3 in West Virginia), make ferro-silicon, ferro-chrome, ferro-tungsten, etc., by electricity.

Capacity of Furnaces According to Fuel Used.—The average annual capacity of the 55 charcoal and 5 mixed charcoal and coke furnaces in 1901 was 14,179 gross tons, and the average annual capacity of the 56 charcoal furnaces that are now described is 15,207 tons. The average annual capacity of the mineral fuel furnaces in 1901 was 69,252 tons; in June, 1904, it is 73,286 tons.

Rolling Mills and Steel Works.—The directory for 1901 enumerated 527 completed rolling mills and steel works, 28 in course of erection, 1 being rebuilt, 1 to be rebuilt, and 6 projected. The present edition enumerates 572 completed rolling mills and steel works, 12 in course of erection, 1 being rebuilt, and 2 partly erected. In addition the

directory mentions 14 projected plants. The annual capacity of the completed rolling mills in 1904 amounts to 25,978,050 tons of finished rolled products, as compared with 23,220,350 tons in 1901.

Puddling Furnaces.—The number of puddling furnaces in November, 1901, each double furnace counting as two single furnaces, was 3,251. In June, 1904, there were 3,161 puddling furnaces. The highest number of puddling furnaces reported in any edition of the directory was in 1884, when 5,265 were enumerated.

Bessemer Steel Works.—The total number of completed Bessemer steel works in November, 1901, including 1 Clapp-Griffiths plant, 2 Robert-Bessemer plants, and 9 Tropenas and "special" Bessemer plants, was 47, and the whole number of converters was 100. In June, 1904, there were 32 standard Bessemer steel works with 75 converters, 1 Clapp-Griffiths plant with 1 converter, 2 Robert-Bessemer plants with 3 converters, 10 Tropenas plants with 14 converters, 1 Bookwalter plant with 1 converter, 1 Evans-Wills plant with 2 converters, and 4 plants with 7 converters which make steel by special processes: total number of Bessemer plants, 51; total number of converters, 103. The increase in the number of small Bessemer plants in the last few years is noteworthy. Since November, 1901, 6 standard Bessemer plants with 15 converters have been dismantled. In addition 2 Tropenas plants with 3 converters have been abandoned. The annual capacity of the completed and building Bessemer converters in November, 1901, was 12,998,700 gross tons; in June, 1904, it was 13,628,600 tons, an increase of 629,900 tons. No basic-Bessemer steel is made.

Open-Hearth Steel Works.—The directory for 1901 described 112 completed open-hearth steel plants, with 403 completed furnaces. The present directory describes 135 completed plants, with 549 completed furnaces. In 1901 12 open-hearth plants with 40 furnaces were building, 1 plant was to be rebuilt, 13 plants were projected, and 6 furnaces were being added to existing plants. In June, 1904, 5 open-hearth plants with 9 furnaces were building, 2 plants with 3 furnaces were partly erected, 17 plants were projected, and 13 furnaces were being added to existing plants. In addition 1 open-hearth steel plant which has 4 completed furnaces had 3 furnaces which were partly erected several years ago, but upon which work had been indefinitely suspended. The annual capacity of the 549 completed and the 28 building and partly erected open-hearth furnaces, in ingots and direct castings, in June, 1904, was 11,335,100 gross tons, against an annual capacity in November, 1901, of 8,289,750 tons, showing an increase of 3,045,350 tons.

Growth of Basic Steel.—The directory indicates the character of the product made at our open-hearth steel works, whether acid or basic steel, or both. Of the 403 completed furnaces in November, 1901, 236 were prepared to make basic steel and 167 to make acid steel, and of the 46 building furnaces 33 would make basic steel and 13 acid steel. The completed and building basic furnaces had an annual capacity of 6,415,100 tons and the acid furnaces of 1,874,650 tons. In the present directory 185 open-hearth furnaces are described as making acid steel and 364 as making basic steel; also 4 acid and 24 basic furnaces as being built or as partly erected; total, 189 acid and 388 basic furnaces. The acid furnaces have an annual capacity of 2,015,900 gross tons of ingots and castings, and the basic furnaces of 9,319,200 tons.

Crucible Steel Works.—In November, 1901, there were 45 completed crucible steel plants, equipped with 2,896 pots, and their aggregate capacity was 175,000 tons. In June, 1904, there were 57 completed plants, the number of pots was 3,606, and the aggregate annual capacity of the plants was 226,610 tons.

Steel Castings.—In 1901 there were 56 open-hearth steel plants which were prepared to make steel castings, and in June, 1904, there were 84 plants. The production of open-hearth steel castings has greatly increased since 1898. As already mentioned, the number of small Bessemer plants has also increased since 1901, all of which make steel castings. Steel castings are also made by 26 crucible plants; also by a few plants which use special processes.

Rail Mills.—The directory for 1901 enumerated 45 roll-

SUMMARY BY STATES. CAPACITIES OF ROLLING MILLS AND STEEL WORKS.

States—Gross tons	Rolling Mills *a*		Bessemer Steel Works *b*		Open-hearth Steel Works *b*		Crucible Steel Works		Total annual capacity of ingots and castings, in gross tons.
	Number of completed works	Annual capacity of finished rolled products	Number of converters	Annual capacity of ingots and castings	Number of furnaces	Annual capacity of ingots and castings	Number of completed works	Annual capacity of ingots and castings	
Maine	1	30,000							
Mass.	7	255,100	2	31,200	14	214,000	4	1,750	246,950
Rhode Isl.	3	78,000	2	2,500	2	20,000			22,500
Connecticut	6	177,500			6	87,000	2	2,400	89,400
New York	21	1,416,500	8	1,046,800	20	407,800	4	13,780	1,468,080
New Jersey	20	584,300	5	7,500	15	215,000	5	28,200	250,700
Penn.	214	12,548,700	35	5,892,000	254	7,272,900	29	170,205	12,835,105
Delaware	5	83,600	2	3,000	5	170,000			173,000
Maryland	6	515,000	3	500,000	2	35,000			535,000
Dist. of Col.			1	300					300
Virginia	5	172,700	3	61,000					61,000
West Va.	15	634,300	4	340,000	3	24,000			364,000
Kentucky	10	200,800	2	150,000	7	96,000			246,000
Tennessee	1	50,000			1	500	1	300	800
Georgia	1	20,000							
Alabama	11	653,000	*e*1		19	531,100			531,100
Ohio	73	3,981,250	15	3,302,400	55	959,900	1	450	4,262,750
Indiana	29	1,055,900			14	203,500	1	100	208,600
Illinois	24	2,080,000	10	2,088,000	42	841,000	2	3,500	2,932,500
Michigan	4	97,000	2	5,000					5,000
Wisconsin	4	329,000	5	95,000	3	9,400	8	5,925	110,325
Minnesota	1	25,000	1	1,000					1,000
Missouri	4	114,000			5	40,000			40,000
Kansas	1	100,000							
Colorado	2	610,000	2	600,000	6	200,000			800,000
Wyoming	1	18,000							
Wash'gt'n	1	24,000							
Oregon	1	6,000	1	1,200					1,200
California	3	58,400	1	2,000	1	8,000			10,000
Total	475	25,978,050	*c*105	13,628,600	*d*577	11,335,100	57	226,610	25,190,310

a Includes all completed rolling mills, but excludes all works not having hot rolls.

b Includes completed, building, and partly built Bessemer and open-hearth plants.

c Includes 75 completed standard Bessemer steel converters with an annual capacity of 13,551,000 tons of ingots and castings, 1 Clapp-Griffiths converter with an annual capacity of 30,000 tons, 3 top-blown converters with an annual capacity of 2,500 tons, 14 Tropenas converters with an annual capacity of 20,500 tons, 2 Evans-Wills converters with an annual capacity of 5,000 tons, 1 completed and 2 building Bookwalter converters with an annual capacity of 6,000 tons, 3 Robert Bessemer converters with an annual capacity of 7,400 tons, and 4 special converters with an annual capacity of 6,200 tons.

d Includes 189 completed, building, and partly erected acid open-hearth steel furnaces with an annual capacity of 2,015,900 gross tons of ingots and castings and 388 basic furnaces with an annual capacity of 9,319,200 tons of ingots and castings.

e Converter used for desiliconizing and decarburizing molten metal for the open-hearth furnaces of the Tennessee Coal, Iron & Railroad Co.

ing mills which were prepared to make standard, girder, light T, and other iron and steel rails, and 3 mills as in course of erection. In the present edition we enumerate 44 completed rail mills, 1 building, and 1 projected.

Structural Mills.—The whole number of works which are now equipped to roll beams, beam girders, zee bars, tees, channels, angles, bridge rods, building rods, plates for bridge work, structural tubing, etc., is 70, as compared with 67 in November, 1901.

Plate and Sheet Mills.—In the directory for 1901 were enumerated 153 completed plate and sheet mills, 7 building, and 1 projected. The present directory shows 157 completed mills, 2 building, 1 partly erected, and 4 projected.

Iron and Steel Skelp Mills.—The directory for 1901 enumerated 60 completed iron and steel skelp mills and 2 building. There are now 61 completed mills and 2 projected.

Black Plate Mills.—In the directory for 1901 appeared 46 completed black plate plants, 6 building, and 1 projected. In the present directory are 49 completed and 3 building plants.

Tinplate and Terne Plate Works.—In November, 1901, there were 55 completed tinplate and terne plate works, 7 building, and 1 projected. In the present directory are given 53 completed works, 2 building, and 1 projected.

Wire Rods.—In November, 1901, there were 32 completed wire-rod mills, 4 building, 1 rebuilding, and 1 projected. In June, 1904, there were 33 mills equipped to roll iron and steel wire rods.

Cut Nail Works.—In November, 1901, there were 32 rolling mills which were devoted in whole or in part to the manufacture of cut nails and cut spikes, containing 3,161 nail and spike machines. In June, 1904, there were 23 rolling mills which made cut nails and cut spikes, equipped with 2,302 nail and spike machines. These were located in 8 states, as follows: Massachusetts, 3; Pennsylvania, 8; Virginia, 1; West Virginia, 3; Kentucky, 1; Ohio, 4; Illinois, 2; and California, 1. In addition 1 cut-nail works was being built in Indiana, to be equipped with 102 cut-nail machines. The cut-nail works are fully described in the supplement to the directory for 1901, published in 1903.

Natural Gas.—The directory for 1901 enumerated 110 completed iron and steel works which used natural gas and 7 in course of erection. In June, 1904, the total number of works which used natural gas was 135, and in addition 2 works to use natural gas were being erected, 1 works was partly erected, 1 works was rebuilding, and 2 works were projected, as follows: 54 completed in Allegheny county and 33 completed and 1 projected in other parts of Western Pennsylvania; West Virginia, 11 completed and 2 building; Kentucky, 1; Ohio, 19 completed, 1 partly erected, and 1 projected; Indiana, 16 completed and 1 rebuilding; and Illinois, 1.

Forges and Bloomaries.—The number of pig and scrap iron bloomaries which made blooms, billets, etc., for sale in November, 1901, was 8, nearly all of which were active in that year. The number of forges which made blooms directly from the ore was 2. The number of bloomaries now enumerated is 8 completed and 1 building. The number of forges which make blooms directly from the ore is reduced to 1, located in New York.

J. Walter Bell, of Louisville, Ky., George H. Hull and others are promoting a scheme for the organization of a million dollar corporation to be known as the National Storage Warrant Co., the purpose of which is the establishment of a string of warehouses in important cities of the cotton belt for the storage of cotton. Mr. Hull is the president of the American Pig Iron Storage Warrant Co., New York.

The bankruptcy case of the Wright Taper Roller Bearing Co., Buffalo, N. Y., has been adjourned in order to give the trustee in bankruptcy an opportunity to close a contract for the sale of the plant.

EASTERN PENNSYLVANIA.

HARRISBURG, Pa., Aug. 15.—A more hopeful feeling pervades the iron and steel works offices in this part of the state and works are being kept going while inquiries and a few small orders are occupying the time of managers. The hopes for September are based on general conditions. In this city all of the works are running and at Steelton the Pennsylvania Steel Co. has its plant going on fairly good schedules. The National Tube Co.'s Middletown works are also in operation. At Lebanon the Pennsylvania Steel Co. has started its largest furnace making two active.

An interesting event at Reading is the completion of a Brown six-inch wire gun for the government. It will be sent to Sandy Hook within a few days. The gun weighs over 20,000 pounds and if it proves a success it is thought that orders will follow.

The Eastern Steel Co. at Pottsville has lately bought over $60,000 worth of land for extensions, the scope of which has not yet been made public.

The American Car & Foundry Co. will erect a large addition to its Berwick plant. The plans are now being made.

The Greer-Clarkson Machine Co. has been reorganized at Manheim with $50,000 capital. H. M. Beamsderfer has been made president.

The Reading Iron Co. is steadily pushing forward its policy of rebuilding its plant. Parts of the mills in Reading and the famous Scott works are being rebuilt and machinery of late patterns added.

The old furnace property at Chambersburg, which had been idle for years, has been sold and the buildings razed.

Recently incorporated companies are: The Keystone Metal Co., Hazleton, capital $20,000; United States Cutlery Co., Philadelphia, capital $50,000, and the Meyersdale Sheet Steel Co., Meyersdale, capital $50,000.

The Thomas Iron Co. has broken ground for the erection of a large engine house which is to contain the new blowing engines, designed to increase the capacity of the stacks at Hokendauqua.

The state has ordered plans made for four new bridges to cost $80,000 and to be built in Columbia county.

Contract for Copper Smelting Equipment.

The Wellman-Seaver-Morgan Co. has a cablegram from its branch office in London, Eng., saying that this firm has been awarded a contract to manufacture and erect for the Fresno Copper Co., Ltd., of England, what will be one of the most complete copper smelting and refining plants ever constructed. It is to be located in Fresno County, Cal., and will consist of two large copper smelting furnaces with a complete equipment of hot blast stoves, blowing engines, Bessemer converting plant and stock handling equipment. The whole lay-out is along the lines of modern engineering practice and in many ways constitutes a decided departure from the ordinary copper smelting practice. It is expected to effect a very considerable saving in fuel, which is an important item in that part of the country, and also to effect a saving in labor cost on account of the improved facilities privided for handling the raw material. The entire equipment will be manufactured in every detail in the works of the Wellman-Seaver-Morgan Co., located in Cleveland and in Akron, O. The company has been operating both its Cleveland and Akron plants at nearly their full capacity, and this latest order will mean many months' work at both plants.

The officers of the Rock Island railroad system state that the report that its shops at Valley Junction, Ia., and other cities are to be abandoned and all of the work done at the new shop at Moline, Ill., is not true. The plan of the company is to have new engines built at the Moline shops and repair work done at other shops of the system.

Louis Nixon has leased the plant of the Perth Amboy Shipbuilding & Engineering Co., Perth Amboy, N. J., from Willard P. Voorhees, the receiver.

Employers' Opinions on the Eight-Hour Day.

The *Monthly Review* of the National Civic Federation presents some of the results of a canvass of manufacturers on the proposal for an eight-hour workday. The question it propounded was this:

"Do you regard it a practical proposition to gradually reduce hours by voluntary uniform agreement through a given industry, providing the employes agree to abandon any arbitrary restriction upon the output?"

There were 920 answers, of which 607 said "yes," coupling this answer with opinions as to the practicability of the plan, ranging from unqualified assent to extreme doubt. The *Review* announces that it will follow up the inquiry by an effort to learn whether workmen are disposed to grant the removal of arbitrary restrictions upon output in return for the shorter day. In summing up the opinions of manufacturers it says:

"These opinions readily divide themselves into groups, according to the point of view, the conditions of an industry, commercial and social theories and the attitude of the writers toward organized labor. It will be observed that there is a general prevalence of assent to the desirability of shorter hours as an abstract proposition. Those who object on the ground of increased cost of production and the restriction of business expansion are offset by those who propose a proportionate reduction of wages as a consideration in addition to unrestricted output. The purpose of both these considerations is identical—lower cost of production. One trade condition that opposes itself to shorter hours is when the industry requires continuous work, carried on by shifts, or tours. The two-shift system means a twelve-hour day. There could be no reduction of hours short of the three-shift system, or an eight-hour day. This, it is urged, would be too violent a change; although there is one instance cited of its economical operation.

"There is a considerable group of replies that express a fear of foreign competition, if the American work-day is shortened. In contrast, another group declares that the demand of the home market, for some products and in active periods, is in excess of the supply, thus creating a need for labor that would only be aggravated by shorter hours. Some manufacturers perceive a tendency toward shorter hours, not by industries, but by localities, beginning in the larger cities and influenced to some extent by time consumed in transit to and from work.

"Many employers would welcome removal of arbitrary restrictions from output in return for shorter hours. But some of these regard such restriction as unsound morally and therefore not negotiable. Others raise the questions of both the responsibility and good faith of trades unions in keeping such an agreement. Still others regard such an agreement as only possible of enforcement when an association of employers is strong. Another group holds that shorter hours can be attained only through the aggressive efforts of unions. Those who believe that shorter hours would result in better social conditions far outnumber those who fear the abuse of more leisure. There are some who maintain that present hours of labor are not excessive, neither impairing the health nor denying reasonable opportunity for self-improvement."

From answers given by employers in the metal trades we take the following as representative:

Agreement as Hopeless as Fantastic.

J. H. Webster, Assignee, Variety Iron Works Co., Cleveland.—Reduced hours of labor mean large increase of fixed charges in capitalization, salaries, real estate, machinery, etc. An industrious man naturally inclines to labor from sunrise until sunset. It has been so ever since labor began. A uniform agreement throughout a given industry can never be reached until that agreement extends to all civilized nations whose products of labor can come in competition. Making it uniform throughout the United States would not prevent the competition of the Old World except by building the wall of tariff still higher. Are we ready to do it? An agreement of employes to abandon any arbitrary restrictions upon output is as hopeless as it is fantastic.

M. E. Clow, J. B. Clow & Sons, Cast Iron Pipe, etc., Chicago.—We do not believe it practical to reduce the hours of labor unless it is the intention of American manufacturers to follow the example of England. If we are to maintain the position we have taken as the greatest manufacturing nation on earth, we must maintain the same reasonable conditions that exist in other countries, and if men are well treated and properly cared for, there is no reason why they cannot work ten hours.

Thomas Devlin Mfg. Co., Castings, Philadelphia.—We favor a unversal eight-hour day.

Falkenau-Sinclair Machine Co., Philadelphia.—From a broad point of view, we believe that if an eight-hour day were universal, it would be a benefit to mankind.

F. H. Stillman, Watson-Stillman Co., Hydraulic Machinery, New York.—Relative to the reduction of the hours of labor by voluntary agreement, I would say that machine tools as used in the shop do not get tired, nor do I believe that in our line of business the attendants upon them are overworked by a sixty or a sixty-six hour week (when the residence is convenient to the shop), and I believe the fifty-four hour week the shortest that is possible at present rate of wages.

J. P. Brophy, Cleveland Automatic Machine Co., Cleveland.—My idea of changing the hours of labor in this country is that if the labor unions as a whole in any particular industry would ask for say a nine-and-a-half hour day instead of ten hours, and agree to lose the wages while the manufacturer lost the output of his factory for this particular half-hour, and have this take place universally, I have not the slightest doubt that all manufacturers in this country would agree to this proposition because it would look to them as though the workingman was willing to sacrifice something in order to gain this shorter day. I also believe that in a short time his wages would come back to normal, or about as it is today. I also believe that after this nine-and-a-half hour day was universal and all the manufacturers on the same footing, then the nine-hour day would come about in the same way and this without any great contention. I believe that if the workingmen were educated up to this point by the leaders of unions a great many of the strikes that we now have and bitterness that these strikes cause would be eliminated, and that the employer and employes would get along very smoothly, and would not have any bitterness in connection with this change in the working hours; but as I understand it, the workingmen in asking for a nine-hour day with ten hours' pay are demanding something that is very unjust, especially when this demand is not universal. As you well know, to any company that has got to grant this concession, it means about 20 per cent of loss in their business. Bear in mind that this company as tool builders have very sharp competition, and if we should be forced to a nine-hour day with our competitors working ten hours, it would almost be necessary for us to close up our factory. It is well understood that there are very few manufacturers in this country that are making as high as 20 per cent, and for this reason it is very easily understood that if we have got to compete, working a nine-hour day, the loss of output for this hour and the extra wages to our men would bring us to a standstill. We could not possibly advance the price of our machines because this price at the present time, owing to competition, is down to rock bottom, and it is very easily understood that if we had to raise the price of our machines, with our competitors working ten hours, this would drive us out of business. If the nine-hour day was brought about in the manner above described, it would, in my opinion, prevent all this bloodshed and trouble that we now have; and before a great length of time it would be the means of bringing together much closer than they are at the present time employers and employes. There is no necessity, in my opinion, for the great and disastrous labor troubles that we have at present.

S. W. Watkins, National Electric Co., Milwaukee.—If this question had been written "Provided employes abandon arbitrary restrictions upon output," our answer would have been, Yes. As written, "Provided the employes *agree* to abandon restrictions upon output," would answer, No.

T. C. Wood, the Ball & Wood Co., Automatic Engines, New York.—We do not regard it as a practical proposition, first, because the conditions surrounding the different shops vary so greatly that it will be impossible to obtain the consent of all the employers in any given industry; and second, because employes could only make such an agreement through their union, and as these are irresponsible, no such agreement can be enforced.

H. D. Sharpe, Brown & Sharpe Mfg. Co., Machinery and Tools, Providence.—It is difficult to say whether such a proposition is practical but it would in no way depend upon what the employes agree. "Restrictions upon output" is not a matter of agreement but one of disposition on the part of both employer and employe. The solution of the question depends upon the proper working together of both.

E. T. Gilbert, Michigan Bolt & Nut Works, Detroit, Mich.—We believe it is practicable to gradually reduce hours by voluntary agreement. Would have no objection to such a movement if it was universal and if we obtained in return a real abandonment of restriction of output.

Gradual Reduction of Hours Impractical

H. F. Wanning, Birmingham Iron Foundry, Derby, Conn.—We do not think it is a practical proposition to gradually reduce the hours. In fact, we started to do this as members of the National Metal Trades Association, but when the arrangement with the International Association of Machinists was repudiated, we went back to ten hours, after winning the strike. It will be necessary, in our opinion, to tie down the membership of unions in some manner to make them live up to their promises in regard to the restrictions of output. If there were really no restrictions whatever, it would be very easy to make up for a nine-hour day in contrast with the present ten hours.

G. W. Fuller, A. S. Cameron Steam Pump Works, New York.—Our plant is now operated on the nine-hour basis, or fifty-four hours a week, instead of ten hours as formerly, but on the same rate of pay per day as before. In other words, ten hours' pay for nine hours' work. We do not regard any further reduction in hours, voluntarily or otherwise, as a permanently practical proposition, for we do not believe there would be any increased volume in the output that would compensate for the added cost of labor due to the reduction in time, which would induce payment at the same rate per day; and we would look upon a removal of "restriction upon output" as a specious offer, and one which past experience has proved the fallacy of.

R. M. Downie, Keystone Driller Co., Beaver Falls, Pa.—We do not believe it is a practical proposition to gradually reduce hours by voluntary, uniform agreement throughout a given industry for the simple reason that labor organizations are not chartered, are not responsible, and it has been our experience that an agreement cannot be made with them which will hold over night if they are disposed to break it. We have tried this and failed. If an agreement is made and a workman finds that he can get more money elsewhere he goes—which, as a matter of fact, is proper and right, but it prevents the possibility of making an agreement in advance which will bind a workman to stay with you any length of time at any given wages. We believe it is wholly useless to try to bind employes to agree to abandon arbitrary restrictions upon output because in so doing the unions would abandon their whole theory of procedure. Their limiting of apprentices is arbitrary, i. e., not founded upon any defensible right or principle of justice. Their limitation of hours is arbitrary and contradicts all personal freedom and even natural law. Their limiting the number of automatic machines a workman may watch is, likewise, arbitrary, and all are urged for one central purpose—the limitation of product. Our large factory today lies a heap of scrap iron and ashes because, after all offers to arbitrate had been refused, we presumed to permit apprentices and regulate hours without the consent of the union. We don't see how we could unite comfortably in any agreement whatsoever with that which ignores the common rights of all men.

J. H. Day, the J. H. Day Co., Machinery, Cincinnati.—We have no confidence in any agreement made by labor unions, and particularly with regard to restrictions upon the output. There are undoubtedly restrictions upon the output in our shops. We know this and see it almost every day, and the only way that hours of labor could be reduced without restrictions upon the output would be by the "premium" or "piece" work system. Several of our workmen have told us that they could easily do the ten hours' work which they are now doing in eight hours, and we believe it, but we found when we reduced the time from sixty hours per week to fifty-seven hours per week that the output was reduced even in a greater proportion.

Ten Hours Better Than Eight.

E. D. Johnston, P. H. & F. M. Roots Co., Rotary Blowers, etc., Connersville, Ind.—We do not regard it a practical proposition to gradually reduce hours by voluntary, uniform agreement, because if the employes agree to abandon any arbitrary restrictions upon output, we could not force them in any possible way to turn out as much work in eight hours as in ten. Generally speaking, we believe it is better for a laboring man to be employed ten hours than eight. It might be all right for some of the more intelligent class, but for the average laborer, he is better at work ten hours than eight. We believe that if there was a general movement to adopt the eight-hour system, in ten years we would have more crime and drunkenness and, generally speaking, a lower order of intelligence among our laboring classes than if we adhere to the ten-hour rule.

C. O. Bartlett, C. O. Bartlett & Snow Co., Mill and Labor Saving Machinery, Cleveland.—If the hours of labor are reduced, it will be to the detriment of our business. We have already lost nearly all of our foreign trade, of which we had quite a large one worked up. Germany and England have taken it practically all. This is chiefly on account of paying high prices for castings and other materials going into our machines.

R. D. Wood & Co., Philadelphia.—My impression is that the hours given to any employment can best be arranged by the character of employment, rather than try to have a uniform rule covering all work. In other words, there are some duties at which people can comfortably work only six hours, and some where twelve hours is not too long. This question of eight hours finally resolves itself into simply whether mankind is going to be satisfied with what they can produce in eight hours instead of what they can produce in ten hours' work, or confining the question to the United States, the question is, will not some other countries work longer hours and take our export trade from us?

N. E. Whitaker, Whitaker Iron Co., Wheeling.—The proposition to reduce hours by voluntary and mutual agreement is thoroughly practical, especially if arbitrary restrictions are removed and abandoned, provided based upon equitable conditions of compensation, but we do not regard the proposition practical, expedient, or equitable, if involving the same compensation for a less number of hours.

C. B. Orcutt, Newport News Shipbuilding & Dry Dock Co., New York.—It may be practicable to gradually reduce the hours of labor, but this can only be done successfully in large plants with a system of supervision so complete that there can be no doubt as to employer getting the full benefit of the hours actually worked; the cost and difficulty of securing proper system of supervision makes one hesitate to state that the proposition is a practical one.

Theo. Bollmann, Hoefinghoff & Laue Foundry Co., Cincinnati.—We are heartily in favor of the reduction in hours provided the employes will agree to abandon the arbitrary restriction of output and the apprentice question.

Wm. A. Lynch, Aultman Co., Oil Engines, Canton, O.—When the production is equal to or exceeds the demand, we would favor a gradual and general reduction of hours of labor, so as to keep all workmen employed a part of the time, but to reduce the hours of labor say from ten to nine hours in a period of great activity would be a loss to the productive capacity of the whole country.

Foreign Trade at Stake.

Thos. H. Williams, A. A. Griffing Iron Co., Steam Warming Apparatus, Jersey City.—This question of hours of labor per day resolves itself in the writer's mind to a question as to whether a shorter day becomes the universal practice or

not. As long as all competitors in our line work nine hours a day it makes no difference to any of them, as the relative position of each one to the others remains the same. If, however, the shorter day prevails to such an extent that it is carried to all other lines, then it becomes a matter of national policy, since it would directly affect the ability of this country to compete in the world's markets. In order that the conditions should remain the same as between one country and another, it would be necessary that all countries adopt the same length of working day. What we fear is that this shortening of hours and thus curtailing of product produced would increase the cost to such an extent that it would curtail the demand and all this is based upon the fundamental principle of supply and demand.

F. A. Wilde, Nordberg Mfg. Co., Engineers and Machinists, Milwaukee.—We regard it as entirely practical to "gradually reduce hours by voluntary, uniform agreement throughout a given industry provided the employes" abandon all restrictions upon the output. Indeed, we sincerely believe the shortening of hours to be most desirable and, therefore, to be earnestly striven for by employers everywhere. But in order to reduce the hours of labor of all, without diminishing the earnings—the enjoying of the comforts of life—it is absolutely necessary to increase the product of each worker in even a greater ratio than that of the decrease in hours. This increase is to be accomplished by improved machinery, better processes and methods and greater ability on the part of each and every employe.

H. E. Hardin, Acme Harvester Co., Peoria, Ill.—The number of hours which employes are expected to work should be optional with the employer, especially if he shows a disposition to be fair, and should be a matter of mutual agreement before the employe goes to work. Conditions are such, especially in our line of business, that an ironclad rule limiting the number of hours of labor to eight or nine per day would work as a great hardship at certain seasons of the year. An employe, who has the interest of a company at heart, should not, in our opinion, be averse to making an extra effort to help them out at such times as it is really necessary, and should not take advantage of such conditions to force the payment of double his regular wage for all overtime.

Nathaniel French, Bettendorf Metal Wheel Co., Davenport, Iowa.—In most branches of work we regard it a practical proposition to gradually reduce the hours of work, being of the opinion that a workman in these branches can expend, without injury to himself, all his daily working force in less than ten hours. In other words, he can do as much work in nine hours as in ten, and possibly in eight hours. An agreement to abandon arbitrary restrictions will be of some value, but it will be broken with great frequency, till the workman learns that he cannot receive more than he produces, that limitation of production must also in the long run prove a limitation of wages, and that increase in production makes possible a higher wage rate.

F. E. Wheeler, International Heater Co., Utica, N. Y.—As a general proposition, reducing the hours of labor means increasing the cost of production. Increased costs means higher prices, and a consequent curtailment of trade. But to leave entirely out of the question the policy of a reduction in hours, or to concede for the moment that the hours of labor are to be reduced in any particular trade, then the most practical way of doing this is by a voluntary, uniform agreement throughout that trade, made through an association of employers which is large and powerful enough to control the situation and who, when granting the concession, will at the same time insist upon the removal of all limitations as to the number of apprentices employed, and all restrictions as to the amount of work done by any employe, in any given time.

Depends on the Object Aimed At.

F. C. Caldwell, H. W. Caldwell & Co., Engineers and Machinists, Chicago.—If an agreement were made which, as you state, would be voluntary and uniform, and would cover an entire industry, such an agreement would certainly be effective. Our idea of the question of shorter hours is that in so far as the reduction of hours is for the purpose of improving the social condition of the employe, the reduction can be brought about; but if the hours are shortened for the ulterior purpose of requiring the employment of a greater number of men, such action would be economically wrong and certainly would fail in the end.

Fred F. Smith, Ferracute Machine Co., Bridgeton, N. J.—We have always believed that the world could work with many less hours than now practiced, if all would agree to it, and if there was no great amount of waste. At present we do not think it wise to change the number of working hours to less than ten in our line of business. In some kinds of business, where the men are exposed to great hardships or unusual strains, the hours should be less, but owners of factories and each set of employes should decide these matters themselves, as it is impossible for outside "delegates," who are not always men of experience, to decide arbitrarily a number of these details. We certainly do not favor a restriction upon output, "for the sake of protecting the poor brother." Every one should produce all he can properly, and the world would then be richer.

W. D. Sargent, American Brake Shoe & Foundry Co., New York.—We regard it as a practical proposition to reduce hours where the employer finds he can do so without seriously interfering with the rate of production or his profits; but conditions differ so much over the country that we doubt if a shorter work-day can be brought about uniformly throughout the country, and feel that it must come by districts, and that each district should demand from its employes the abandonment of arbitrary restrictions, as suggested in your question, before consenting to the shorter day.

Samuel Moyer, Lunkenheimer Co., Brass and Iron Steam Specialties, etc., Cincinnati.—We believe it practical to gradually reduce the hours of labor by voluntary, uniform agreement throughout a given industry, but we cannot afford to diminish the hours of labor in our shop unless all of our competitors do the same. As regards making an agreement with the employes to abandon any arbitrary restrictions upon output and giving them, in return, reduced hours of labor, would say that, looking at the matter in an abstract way, we cannot consider any such proposition, and any manufacturer who would, had better sell out his business. No manufacturer should recognize the right of any union to place restrictions upon the output, and, if we found that such a case existed in our shop, we would go out of business rather than permit its continuance; hence we do not consider this feature any element in connection with any labor organization, it being non-arbitrable.

A Questionable Bargain.

G. A. True, Northern Engineering Works, Detroit, Mich.—In reference to an agreement with the employes to abandon restrictions upon output, in exchange for shorter hours, we do not believe the questions are on the same moral plane. We employ our men on a basis of hours and wages mutually agreed upon; under this agreement the workman owes his employer a fair day's work. If he limits his output he cheats his employer. Your proposition implies the gift to the workman of an hour or so a day, in consideration of a promise of the workman to quit stealing his time. We doubt the wisdom or morality of such a bargain.

R. D. Reed, H. B. Smith Co., Iron Founders, Westfield, Mass.—I personally believe that the hours of labor will be reduced probably eventually to eight hours in all lines of manufacture, but I have been led to believe that the reduction in the hours of labor will not follow given industries. It has already started in the large cities, and no doubt next year most of the cities of the first class will in all lines of industry be reduced to eight and nine hours; and I feel that it is just that it should start in the larger cities, on account of the length of time it takes the workmen to get to their respective places of work. I feel that a general reduction of the hours of labor throughout the country will not be attained, and it is not best that it should be attained, until times are much different than at present. It seems to me that the labor leaders should consider that at the present time, when nearly every line is pushed to its utmost, that this is not just the time to reduce the hours of labor. No doubt in the future all lines of manufacture will not be so pushed, and I have every reason to believe that a good many of the manufacturers themselves will voluntarily reduce the hours which

constitute a day's work. I am satisfied, however, that in the the lines of manufacture which I am familiar with, the reducing of the hours of labor will actually reduce the output with present methods, but I do believe it is the duty of each employer to himself to consider this matter seriously, and prepare himself for this reduction in the hours of work of his employes.

E. W. Peck, Co-operative Foundry Co., Rochester, N. Y.—The chief restriction is as to the number of apprentices. We deem this feature the most objectionable and tyrannical, and our experience this year has been such as to arouse our strongest antipathy to it; more especially in the unions connected with stove manufacture are young men prevented, through restrictive apprenticeship rules, from learning the trade. We should not look with disfavor upon a uniform and voluntary reduction of hours by the employers, provided the union would agree to some modification of apprentice rules to the end that there might be enough mechanics to fill requirements of the trade, as now there are not, in our particular line, and the situation is growing worse monthly. If, in addition to this, hours of labor were shortened, a very serious condition of affairs would quickly ensue.

The *Railroad Gazette* gives some figures pertaining to the speed of train No. 25, of the Atlantic City railroad. This train on Wednesday, July 20, was run from Camden, N. J., to Atlantic City, 55.5 miles, in 43 minutes, equal to 77.4 miles an hour. The record on the train dispatcher's sheet shows that the train ran from Winslow Junction to Meadow Tower, 29.3 miles, in 20 minutes, or at a rate of 87.9 miles an hour. There were in the train one combination car, three passenger cars and one parlor car. The times at Winslow Junction and at Meadow Tower are recorded in even minutes, so that the rate of speed is probably subject to some slight correction. The best previous record over this line is that of Aug. 5, 1898, when the run through was made in 44 minutes 45 seconds (74.4 miles an hour); but in that case there were six cars. On Aug. 20, 1898, a train of seven cars was run through in 46 minutes 45 seconds.

President Howard Elliott, of the Northern Pacific, in an interview at Spokane last week, said: "We are doing an immense amount of work between here and the coast, putting in new 85-pound rails, ballasting the road and improving bridges. All the rails laid by the company will be 85 pounds, so in a few years the whole line from St. Paul to the coast will be laid with them, instead of 60-pound steel. The company has ordered a lot of new equipment for delivery about September. It is getting 850 new box cars, 50 refrigerator cars and 200 ballast cars. The ballast cars are about ready now. In addition it is getting 25 freight engines and six large passenger engines. The outlook for traffic this year is favorable. I cannot say that it will be larger than any other years before, but the crops are certainly very promising. I have been through the grain sections of Washington, and they look good."

At the office of the Secretary of State in Albany, N. Y., a certificate of incorporation has been filed by the Morse Dry Dock & Repair Co. as the successor of the Morse Iron Works, Brooklyn, which went through bankrutpcy proceedings last October. The plant at one time employed 2,000 men. The incorporation of the new company practically insures a resumption of active operations. The company is capitalized at $600,000. The directors are: Daniel J. Leary, E. P. Morse, John P. Caddagan and George Leary, of Manhattan, and William C. Reid, of Brooklyn.

The firm of Henry R. Worthington has published a small map showing the location of its old works in South Brooklyn, the offices in Manhattan and the new works at Harrison, N. J., with the inter-communicating lines of transportation. The old works were founded in 1840 and now cover about 4½ acres and employ 2,000 men. The new plant occupies a 34-acre tract, has 18 acres of floor space and will accommodate 6,000 workmen.

LAKE SUPERIOR IRON MINES.

Of the 15 iron mines of the Oliver Iron Mining Co., in the Hibbing district, nine are actively mining and shipping ore. About 1,500 men are employed and a considerable amount of ore is forwarded each day, but it is not expected that the season's output will equal that of last year. At the opening of the season, the Hull mine had a stock pile of 35,000 tons, which has been shipped out, and at present no mining is being done. The pumps are in operation and the property kept free from water, but it is not expected that mining will be resumed before fall. The Rust mine had a stock pile of 130,000 tons at the opening of the season, of which 30,000 tons has been shipped. A force of 150 men is employed. The Penobscot, which has been idle for some time, is likely to remain inactive for an indefinite period. A quantity of mining timber is being taken from this mine to other properties of the company in the district. The Sellers has 100,000 tons of ore on stock piles which will probably be removed before the close of navigation. Mining is being carried on with about 125 men. At the Day, 50,000 tons of ore are on stock dock. A force of 75 men is employed in mining. The Burt is shipping from 5,000 to 12,000 tons daily. The stripping work at this mine is being done by the Vincent-Dear Contracting Co., of Minneapolis. The Morse is an open pit mine, and will probably remain inactive until next year. Considerable stripping has been done. The stock-pile of the Pillsbury has been shipped and nothing has since been done. The pumps are in operation. The Glen has a stock-pile of 100,000 tons and is actively engaged in mining with a force of 175 men. No ore is being taken from the stock pile. Two hundred men are employed at the Clark and two shafts are now in operation. The stock dock contains 125,000 tons of ore. A shaft is in operation at the Chisholm. A stock pile of 75,000 tons is not being touched. The Howard is a new property and will probably not make shipment until next year. Eighty men are employed on development work. One shaft is going down and has a present depth of about 175 feet. The mine lies under the Shenango, which is now the wettest mine on the Mesabi range. The Monroe-Tener is also a new proprty and has not yet made shipment. A great deal of development work is now going on. Three shafts are being sunk. The St. Clair was opened last year and made a small shipment. At present nothing is being done. The Sharon is inactive and probably will remain so until next year. It is an open pit proposition.

There is not much activity at present in the Crystal Falls district, Menominee range. The stockpile of the Great Western mine has been shipped. The stockpile of Crystal Falls is being rapidly removed. Nothing official is known in regard to the shipping of the stockpile of the Lamont. The Armenia has a stockpile of about 25,000 tons which may be shipped before the season is ended. At the Mansfield nothing is doing beyond repairing of pumping machinery, and it is not likely that any ore will be shipped this season. At the Tobin about 2,000 tons per day are being forwarded from mine and stockpile. At the Bristol the work of sinking and developing is continued with about half a crew.

Superintendent C. T. Roberts, of the International Harvester Co.'s mining interests in the Baraboo field in southern Wisconsin, is working his mines full force and has been short of miners. He has recently employed a few miners from the Crystal Falls district.

The Brown-Corliss Engine Co., Corliss, Wis., has been awarded a contract for four large vertical cross compound Corliss engines, to be direct connected to generators, for the Washington navy yard—one of the most important installations that has been placed with engine builders within the past year. The company notes that all conditions at present seem to indicate that the coming year will be a very busy one.

All loading records for the Great Lakes were broken Aug. 11 at Escanaba, Mich., when the steamer Frank Peavey took on 7,375 net tons of ore in 51 minutes at the Milwaukee dock.

INDUSTRIAL SUMMARY.

(If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.)

New Buyers in the Market and Some of Their Wants:—

A. N. Cristoffanini, of Garibaldi 18, Genoa, is now in New York inquiring for the machinery necessary for the equipment of a large steel plant to be built in Northern Italy. The specifications call for one plate bending roll machine with three rolls to be driven by three electric motors; one plate bending roll machine with four rolls and two motors; one plate roll bending machine with three rolls and one motor; one angle iron bending power machine with four rolls to be operated by a motor; one planing machine for flanging iron plates to be driven by a motor; one punching cutting machine with motor and two lathes to be operated by motors. In all about 500-h. p. of motors will be installed in the plant. There will also be 11 traveling cranes, to be electrically driven. These equipments will vary in capacity from three to ten tons each.

The Electric Steel Casting Co., Matthews, Ind., has been incorporated with a capital of $50,000. Directors are: G. S. Rinebolt, Philip Hughes, Philip Angsten and W. K. Gore.

The Eagle Foundry Co., Muncie, Ind., has been incorporated with a capital of $5,000. Incorporators are: J. R. Crozier, H. D. Hartley and Harry Rewader.

The Columbia Tool Steel Co., Chicago Heights, Ill., has been incorporated with a capital of $200,000, to manufacture iron and steel. Incorporators are: C. C. Johnston, Frederic E. Von Ammon and Major McGregor.

The Myers Mfg. Co., Chicago, Ill., has been incorporated with a capital of $10,000, to manufacture machinery. Incorporators are: P. A. Myers, J. W. Meyers and W. D. Schmidt.

The Western Overdraft Heater Co., Rockford, Ill., has been incorporated with a capital of $10,000 to manufacture stoves, heaters and furnaces. The incorporators are: R. Henry Bruce, Martin A. Banks and Frank S. Regan.

The Eagle Foundry Co., Muncie, Ind., has been incorporated with a capital of $5,000. The directors are: J. Ross Crozier, Harley D. Hartley and Harry Rhoads.

The Columbia Tool Steel Co., Chicago Heights, Ill., has been incorporated with a capital of $200,000. The incorporators are: Charles C. Johnson, Frederick E. Von Ammon and Maj. McGregor.

The Bridgeport Foundry & Machine Co., Bridgeport, Conn., has been incorporated with a capital of $50,000. The incorporators are: Rollin D. Whipple, Charles N. Choate and Charles E. A. Thompson.

The Lakeside Foundry Co., Chicago, has been incorporated with a capital of $2,500 to manufacture stoves and ranges. The incorporators are: H. A. Oberman, N. A. Tighe and Charles Dolan.

The Ontario government has granted a charter to the Northern Machinery Co. with a paid-up capital of $40,000. The incorporators are: F. H. Macpherson, C. A. Windsor, J. T. Nichols, Allan W. Atterbury, C. A. Rathbone and Irving W. Durfee, all of Detroit. The company has not yet selected a city for its proposed plant.

Fires and Accidents:—

The automobile plant owned by the Fauber Mfg. Co., Elgin, Ill., was almost totally destroyed by fire Aug. 11. The loss approximates $40,000. The property was well insured.

Fire of unknown origin broke out in the paint room of the Kitselman Wire Fence Co., Muncie, Ind., Aug. 3, causing a loss of $10,000, covered by insurance.

Fire in the five-story building of the Co-operative Foundry Co., Rochester, N. Y., Aug. 6, caused a damage of $10,000.

New Construction:—

The Bessemer Foundry Co., which was recently incorporated in Delaware, has applied for a charter in Pennsylvania, and will locate its plant in Grove City, Pa. The capital stock is placed at $12,000.

The Carbondale Foundry & Machine Co., of Carbondale, Ill., has purchased five acres a short distance from the Marion Junction of the Coal Belt railway and will erect a large foundry and machine shop for making mining and other machinery.

Born Bros., of Belleville, Ill., have added a foundry to their machine shop.

The Geiser Mfg. Co., of Waynesboro, Pa., is enlarging the foundry in connection with its plant in Greencastle, Pa., by constructing an additional building adjoining the old structure.

The Racine Boat Mfg. Co., of Muskegon, Mich., has closed a contract for a new foundry building 65 x 100 feet. It is to be constructed of brick and stone and it is estimated that it will cost about $6,000.

The Reading Iron Co., of Reading, Pa., is building a pattern shop and pattern storage building 75 x 170 feet, 4 stories.

The Grand Rapids Foundry Co., of Grand Rapids, Wis., has secured a site for the erection of a machine shop, foundry and pattern shop. The buildings are to be constructed of concrete blocks.

Mallice & Holcomb, of Topeka, Kan., are planning to build a foundry 75 x 132 feet, at a cost of $7,000.

The people of Canton, O., have raised the $10,500 necessary to retain the location of the shops of the Wheeling & Lake Erie railroad, which were destroyed by fire some months ago. The city will purchase the land and the company will erect the shops. The cost of the buildings and equipment will be about $70,000; the track improvements will cost $30,000.

The Janesville Barb Wire Co., Janesville, Wis., has purchased additional land and will build a large addition to its warehouse.

The American Car & Foundry Co. will build an addition 200 x 188 feet to its plant at Berwick, Pa. The new plant will cost $100,000.

The Albany Forge Co., Albany, N. Y., which recently purchased three acres a short distance from the city limits of Albany, will erect a forge plant and furnace building and also a machine shop.

It is officially announced that the John A. Roebling's Sons Co., Trenton, N. J., will move its rolling mill, employing 400 men, from Trenton to Kinbora, N. J., where the company recently purchased a large tract of land. The mill will be enlarged so as to employ from 800 to 1,000 men. For the present the remainder of the plant now in operation and employing about 3,000 men will be continued in Trenton.

The Vandalia Railroad Co. contemplates building new shops, or remodeling the present plant at Terre Haute, Ind. For several months Superintendent of Motive Power Arp has been visiting shops in different cities for the purpose of getting points on shop construction.

The Gardner Convertible Steam & Gas Engine Co., Washington, Pa., is erecting a machine shop 52 x 100 feet. A foundry will be built later.

The National Electric Co., Milwaukee, manufacturer of Christensen air brakes and electrical machinery, has commenced extensions to its foundries.

The Union City Foundry Co., Union City, Pa., has erected a foundry 70 x 100 feet, with an ell 50 x 90 feet. Equipment will be installed this month. General foundry work will be done.

The Indestructible Post Co., successor to the fence post department of the Inland Steel Co., Chicago, has purchased a box factory at Paw Paw, Mich., which will be remodeled for its purpose. A new plant is nearing completion at Pennville, Ind., and a plant is in operation at Chicago Heights, Ill.

The Dornfeld-Kunert Co., Chicago, has completed its plant at Watertown for the manufacture of boilers, tanks, bridges, castings, etc. The new buildings have a total floor area of 25,000 square feet.

The Central Car & Foundry Co. expects to begin work in a few weeks on its plant at Vincennes, Ind. The company has a tract of 40 acres along the Big Four railroad. There will be nine buildings, one of which, the erecting building, will be 121 x 500 feet. Concrete will be extensively used and the plant will cost about $250,000. It will employ 500 men when in full operation.

The Ansonia Copper & Sheet Iron Co., Cincinnati, will

erect a one-story brick and stone shop at a cost of $8,000.

The Thomas-Fordyce Mfg. Co., Little Rock, Ark., is doubling the capacity of its plant. The foundation of the new pattern shop, which will be 33 x 95 feet, two stories, has been completed. The foundry is being enlarged by an addition 42 x 75 feet. Two new cupolas are to be installed, one for brass and the other for iron. The machine shops have been equipped with the latest improved machinery. This department is 151 x 47 feet. A new boiler building is also being erected. The company manufactures a complete line of cotton-ginning machinery, engines, boilers, sawmills, etc.

The Maryland Steel Co., Sparrow's Point, Md., is rebuilding its pattern shop recently destroyed by fire. The floor area, available for pattern making, will be increased about 25 percent.

The contract for the new Philadelphia & Reading R. R. car shops, at Newberry, Pa., has been awarded to Shoemaker & Co., of Philadelphia, and it is expected that the work of construction will soon be completed.

The Best Mfg. Co., of Pittsburg, manufacturer of brass products, has decided to remove its plant to West Pittsburg, near New Castle Junction, Pa. The main building will be 600 feet long and 390 feet wide. This town has grown rapidly in the past few years, several large industries, including the Garland Rivet Co. being located there.

General Industrial Notes:—

The Central Iron & Steel Co., Harisburg, Pa., has secured the contract from the Maryland Steel Co. to roll the plates which are to be used in building the Staten Island ferry boats. About 1,000 tons of steel plates will be required.

The Brylgon Steel Casting Co. is dismantling its shops at Reading, Pa., preparatory to removal to New Castle, Del. The new plant when in full operation will employ about 250 men.

The Rock Island railroad has ordered five steel cars made with the special object of protecting express packages from robbers. The cars will be made of heavy sheet steel with a vault in one end of the car.

C. A. Freeland and brothers, Lloyd and Bruce, of Sturgis, Mich., have purchased all the stock in the B. F. Freeland Sons Co., manufacturer of steel tanks. The company expects to enlarge its plant to accommodate increasing business.

The Gade & Harbenbrock Gasoline Engine Co., Iowa Falls, Ia., will hereafter be known as the Gade Bros. Co. Mr. Harbenbrock has retired from the concern.

The new foundry of the Gisholt Machine Co., at Madison, Wis., is now in operation. The construction and equipment have cost about $50,000.

The J. M. Mossman Co., New York, recently incorporated with a capital of $60,000, succeeds to the business of J. M. Mossman, 72 and 74 Maiden Lane, who for more than 25 years has been caring for the time locks made by the Sargent & Greenleaf Co., the actuating devices made by Burton-Harris, of Chicago, and the time locks and actuating devices made by the Diebold Safe & Lock Co., of Canton, O. Mr. Mossman has charge of about 3,500 banks in the United States, and fearing that his death might interfere with the continuation of the business, he decided to incorporate.

The Hall blast furnace of the Republic Iron & Steel Co., Sharon, Pa., was blown out last week for relining. The Haselton stack of that company is the only one now operating. The Atlantic furnace at New Castle was blown out several weeks ago, while the Hannah furnace at Youngstown is banked. It was erroneously stated in these columns last week that the Haselton furnace was out.

The Toledo furnace of Pickands, Mather & Co., Toledo, O., is to be blown in about Aug. 20. This stack has been out for nearly two months, but an accumulation of orders necessitates a resumption of operations.

Owing to a breakdown in the machinery, a portion of the finishing departments of the LaBelle Iron Works, Steubenville, O., was shut down last week.

The Southern Can Co., New Orleans, the organization of which was completed some months since, is now in active operation and has one of the best equipped can manufacturing plants in the United States. It hs a capacity of 70,000 cans per day and is now turning out about 30,000 cans per day. The officers of the company are: M. O.Keefe, president; L. E. Valloft, vice president; F. D. Becker, secretary and treasurer, and A. G. Ricks.

The New York & Baltimore Transportation Co. has purchased the machine shop of Charles Reeder & Sons, Baltimore. The building has a frontage of 200 feet on Henry street and runs back 400 feet to the water front. The firm of Charles Reeder & Sons retired from business in 1900, owing to the death of Charles Reeder Sr. The transportation company will use the plant for storage and transportation purposes.

At the second receiver's sale of the Mackie Steel Tube Works, Hammond, Ind., the plant was sold to the Champion Potato Digger Co.

The American Corrugated Furnace Co., Allentown, Pa., has been incorporated under the laws of New Jersey with a capital of $350,000, and has purchased the plant of the Waever-Hirsh Co., in South Allentown. The company will manufacture patented corrugated furnaces for land and marine boilers as well as pressed steel work, such as automobile frames, car trucks and similar appliances. The directors are: George O. Albright, of Allentown; W. Carlile Wallace, Sheffield, England; Albert F. Matlack, William M. Watson, Mason G. Worth, president of the American Pressed Steel Co., of Philadelphia, and E. G. C. Bleakly, of Camden, N. J.

J. P. Spiker and J. L. Black, of Bowling Green, O., have purchased a three-fourths interest in the McDonald Machine Co., of that city. Wm. Keller owns the remaining one-fourth and will act as manager of the new company, which will be known as the Superior Mfg. Co.

The property comprising the entire town of Smithville, N. J., has been sold for $70,000 to the H. B. Smith Machine Co. Included in the transfer are the machine shops, residences, boarding houses, etc.

The White-Flickinger Co. is the name of the new concern which is to conduct the wheel plant in the old Flickinger buildings at Galion, O. The company will be organized in a few days with a capital of $100,000.

The Newport Rolling Mill, Newport, Ky., will resume in part Monday, Aug. 22, and the entire mill will be in operation a week later.

Edward J. Lahan and his associates expect to get their foundry started at Quincy, Ill., late in September. The company will manufacture stoves under a patent obtained by Mr. Lahan.

The plant of the American Rolling Mill Co., Middletown, O., was not seriously damaged by the recent fire. Such rebuilding as was necessary was promptly done, and the mills were placed in operation Aug. 15.

It is now practically assured that the Peoria Steel & Tool Co. will be located at Peoria, Ill. The citizens of Peoria have shown much interest in the enterprise and are subscribing liberally to assist the company.

The new company called the Electric Steel Co., which recently purchased the Matthews Steel Casting Co.'s plant of Matthews, Ind., from the receiver, now has a force of thirty men at work in repairing the property for its use.

Receiver Samuel Hunt, of the Detroit Southern railroad, has awarded the contract for three new steel bridges to the American Bridge Co., and has contracted for the rebuilding of 1,000 freight cars with the American Car & Foundry Co. The repairs will probably be made at the Car & Foundry Co.'s Detroit shops.

The Iowa Adjustable Gate Co., Des Moines, Ia., recently incorporated with a capital of $10,000, fully paid up, will soon begin the manufacture of an adjustable farm and stock gate. The company will not build this fall, but will lease a building suitable for its purpose.

The plant of the Central Foundry Co., Anniston, Ala., which manufactures sanitary piping and fittings, turned out and shipped during July the largest product of any month in the history of the company.

Dry Steam for Engines

The clearance space of an engine cylinder will take care of a certain amount of water without damage to the engine. But it cannot take care of large flushes of water due to foaming or priming boilers. That is the function of the Cochrane Steam Separators. They will successfully handle any quantity of water up to the quantity which the trap or other drainage system can carry away—plus the storage capacity of the well of the separator.

But these Cochrane Separators also have another duty almost equally important—that of taking small quantities of water or moisture out of the steam in order to give the user the economic value of dry steam. The more water there is in the cylinder at the end of the stroke, the more heat will be stolen from the cylinder walls, and therefore more heat must be taken from the live steam at the beginning of the following stroke to reheat the cylinder walls. By supplying dry steam to the engine the Cochrane Steam Separator reduces to a minimum the quantity of water in the cylinders, preventing unnecessary waste of heat and saving coal and money for the user.

These Cochrane Separators are built in thoroughly good fashion being well designed and well constructed with first-class materials and workmanship. They have an enviable reputation for efficiency and a record of more than 10,000 separators in present satisfactory service. If you are interested in separators for *any* service, remember the name, "Cochrane."

We will send you a copy of our complete Separator Catalogue **11-S** if you wish.

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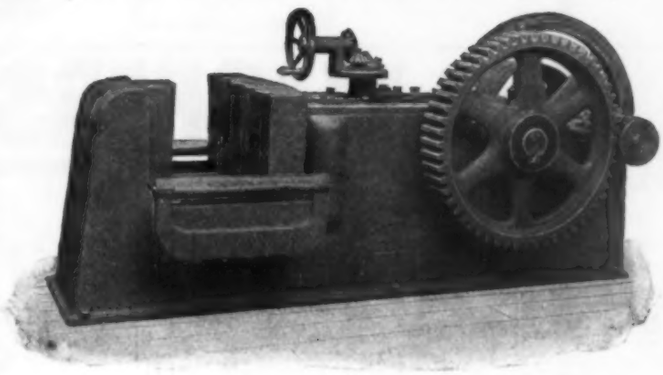

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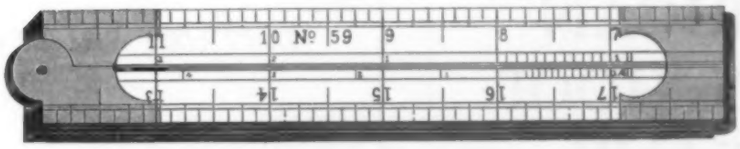

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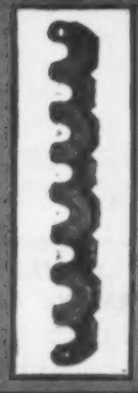

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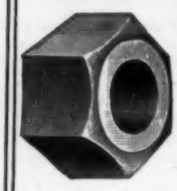

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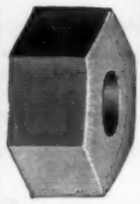

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